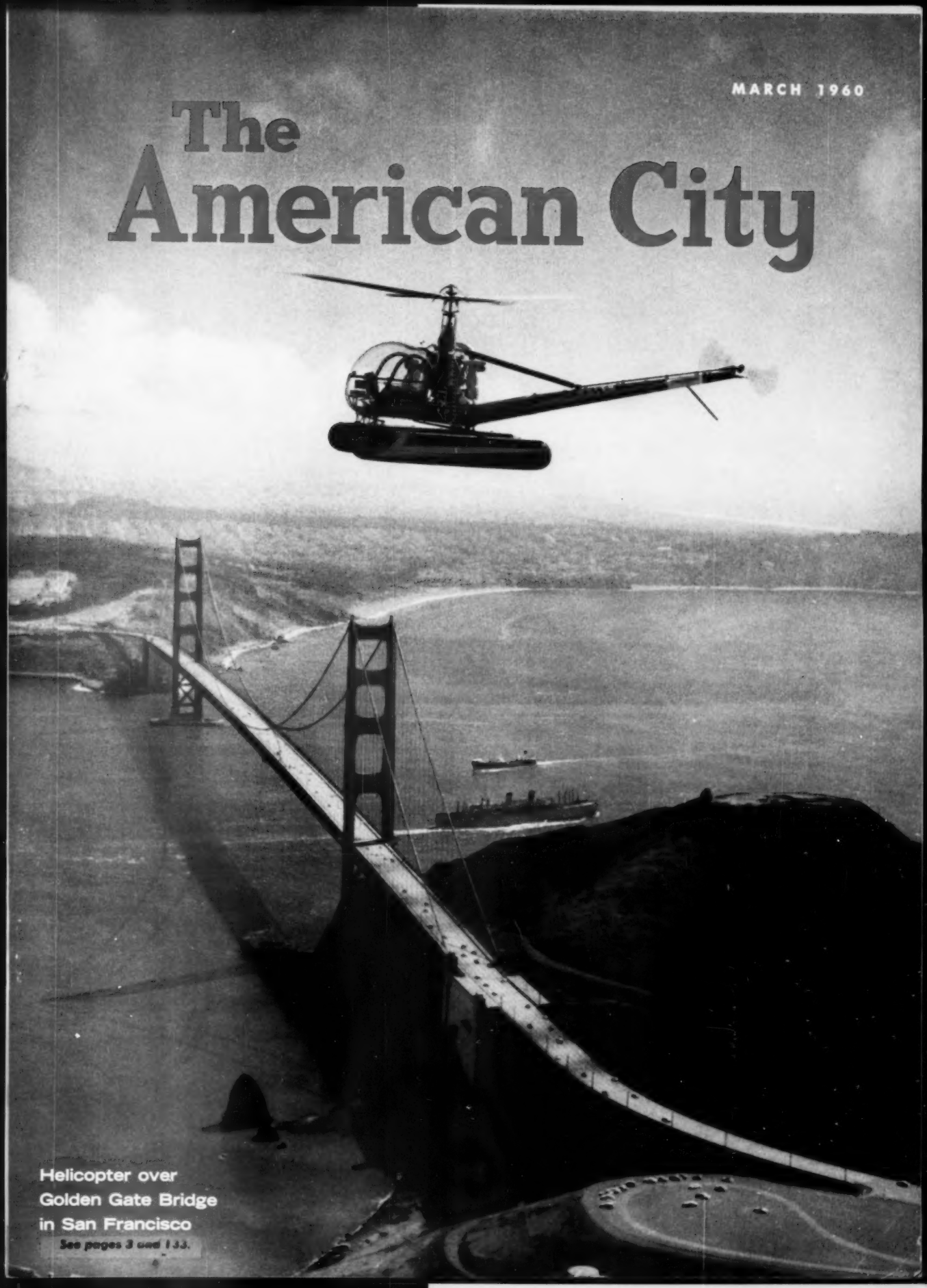
MARCH 1960

The American City



Helicopter over
Golden Gate Bridge
in San Francisco

See pages 3 and 133.

EVENTUALLY, most city streets are paved with asphalt

The original pavement constructed on this street was not Asphalt. Last year, however, it was given a tack coat of cutback asphalt, then topped by a durable, resilient wearing surface of hot-mix Texaco Asphaltic Concrete.

Resurfacing an old pavement of another type with Asphalt gives the city many additional years of service at moderate cost. However, from the standpoint of over-all cost and service, it is better to construct an Asphalt pavement from the start. Asphalt costs less than comparable rigid paving. Its ability to absorb impact enables it to stand up under the heaviest modern traffic year after year, with a minimum of upkeep. Asphalt's resilient, joint-free surface is unequalled for driving ease and comfort. Snow melts faster on Asphalt, which also is immune to ice control chemicals.

Particularly important to city officials is the speed with which Texaco Asphalt paving is laid and opened to traffic. Businesses and residents along the street being paved, as well as motorists, are subject to a minimum of delay and inconvenience.

For assistance with an Asphalt paving or maintenance problem, get in touch with our nearest office listed below. Our 55 years of Asphalt experience is at your service.

▲ Hot-mix Texaco Asphaltic Concrete provides a resilient, heavy-duty wearing surface for a worn pavement of another type.

Using tandem and multiwheel rollers to compact Texaco Asphaltic Concrete to a dense, rugged surface. ▼

TEXACO INC., Asphalt Sales Div., 135 E. 42nd Street, New York 17 • Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 6 • Minneapolis 3 • Philadelphia 2 • Richmond 25

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Please send me your two brochures containing helpful information on heavy-duty, intermediate and low-cost types of Asphalt construction for streets, airports and parking areas.

Texaco Inc., Asphalt Sales, 135 East 42nd Street, New York 17, N. Y.

Name Position

Associated with

Address

The American City

MARCH 1960

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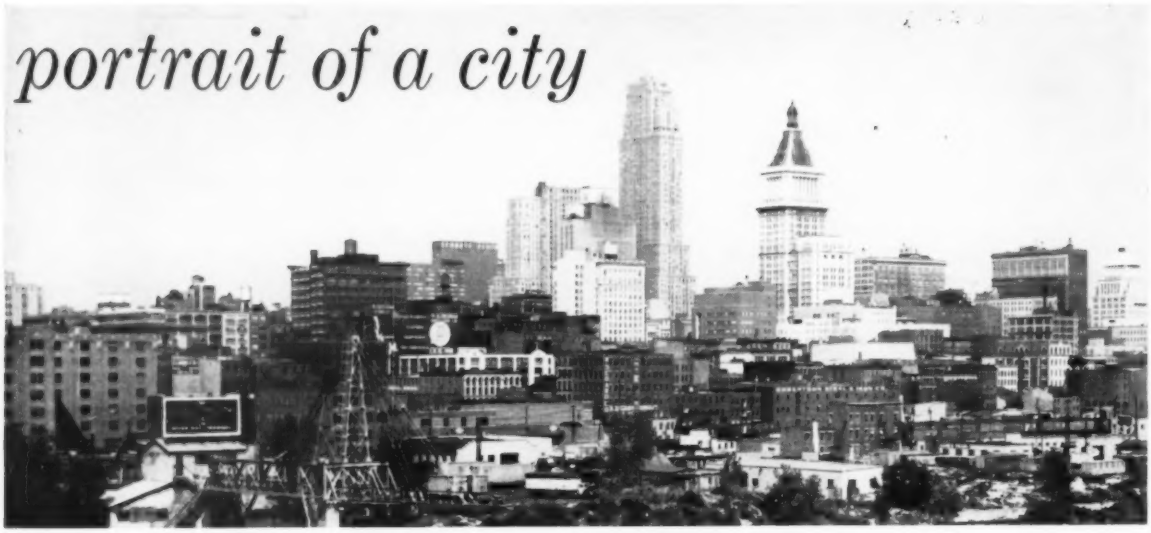
Cover Picture

Big time roads and mounting automobile congestion call for heroic controls and reliefs, such as aerial observation and rapid transit to reduce auto travel. Here is shown the Golden Gate Bridge from Marin County to San Francisco watched by a Hiller 12E helicopter. Will the bridge carry two lanes of rapid transit? David B. Steinman has been retained to find out. See page 133.



Outdoor telephones mean new revenue...new service

The City is Cincinnati, Ohio.

In 1955 the City Council authorized the installation of 72 outdoor telephones on city property. Today, Cincinnati has 354 outdoor phones handling almost 1,800,000 calls annually. By 1962, city officials expect to have 540 outdoor phones and many times the present revenue.

Such rapid growth was possible only because the citizens of Cincinnati enthusiastically welcomed the convenience and protection provided by outdoor telephones. City officials are equally enthusiastic about the steadily increasing revenue provided by a service that doesn't add to the tax burden of the city.

To see how a public telephone plan can be custom designed for your city, call your Bell Telephone manager. A representative will visit you at your convenience.

BELL TELEPHONE SYSTEM

Get the facts about these convenient outdoor telephones: the walk-up phone, the drive-up phone and the outdoor booth.

Volume 75 Number 3

The American City

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ASSOCIATED PUBLICATIONS

Contractors and Engineers	OVERVIEW	
Municipal Index	MART	AMERICAN SCHOOL AND UNIVERSITY

LETTERS TO THE EDITOR

Jumbled Street Appearance

The item in your January 1960 issue ("Modern Street Lighting," p. 115) serves as a comment on the sorry visual appearance of our cities. As "street furniture" the vertical elements provide real variety.

Probably the greatest imagination is demonstrated in the gasoline sign as it is cantilevered out, probably over the public right-of-way. This is pure "Yankee ingenuity."

WILLIAM R. KLATT
City Planner
Rock Island, Ill.

EDITOR'S NOTE: Even so, it's a good-looking lighting standard.

Tapping Fees

Your article on tapping fees created considerable interest in this department. Any summary which could be developed for the problem of such service fees for new customers cannot be resolved into a single overall answer. Each must be "tailored" for each individual case.

The problem opens an involved question: just how much expense can a water utility justifiably assume for any "new" work to acquire new customers? Some cities charge for the meter and its installation; others do not. Akron does no service work on private property; some cities do. Akron charges for renewals of old services; some cities do not.

Were we to offer a "sale price" to attract new customers, we would do so probably under these conditions:

- *when their service lines connect to existing mains;*
- *when they will not create a load that requires major reinforcement of the existing system;*
- *when they do not require extensions of the mains.*

Unfortunately, this is not often the case. Builders of single-family homes like to develop raw land where there are no water mains. Others like to erect big office buildings or tall apartment houses in areas where only one- or two-story buildings formerly had been. If the utility has to spend money because of these new services, should the old customers be required to pay this increment?

Akron's present rate schedule includes a series of charges for installing services from ¾-inch to 1¼-inch in various types of streets and for varying lengths of line. We install larger services on a cost basis. If main extensions are necessary, such extensions become a separate consideration above the service fee. We install domestic water meters at the utility's expense. We expect to, and do, break even.

If other cities are interested in our schedule of charges, we will, of course, be glad to exchange copies.

WENDELL R. LADUE
Superintendent and Chief Engineer
Bureau of Water Supply
Akron, Ohio.

How to Pick Consulting Engineers

Sometime ago you gave the Consulting Engineers Council permission to reprint "Consulting Engineers—How to Select Them" (February 1957, p. 5).

I have prepared a manuscript on the installation, care and maintenance of the mechanical and electrical equipment of school buildings. The manuscript consists of 500 typewritten pages and 129 illustrations. It is now in the hands of John Wiley and Sons for publication this winter.

I should like to have permission to reprint the editorial referred to above with appropriate credit.

HARRY TERRY
Consulting Engineer
Trenton, N. J.

EDITOR'S NOTE: Permission happily granted.

Data Processing In Cities

An Industrial Computer System was recently announced by the Radio Corporation of America. Actually it is a family of computers, with forty options of memory size and speed. It is custom assembled from standard modules to satisfy the customer's exact requirements.

Industrial computers differ from business data computers in several ways. First, they are mechanically constructed to withstand the shock, temperature and corrosive atmosphere of the industrial environment. Secondly, they are usually fixed program devices which are programmed only once for the real-time control of a specific manufacturing process. Its requirement for

(Continued on page 18)

see what the

MASSEY-FERGUSON 1001 TRACTOR SHOVEL

"CAN DO"

to save you manpower... machinery... money!

WIDE RANGE OF QUICK-CHANGE ATTACHMENTS

This Ram Pick-up Street Sweeper is just one of the many money-saving attachments for the M-F 1001. Others include the Ram Blacktop Spreader, Rotary Snow Plow, Ram Leaf Loader, angle dozer, rotary backhoe, swinging crane, lift fork, and scarifier.

Everyone is asking for a reduction in costs and an increase in efficiency. The Massey-Ferguson 1001's performance gives the answer, "Have Done. CAN DO!"

This high-quality, 60.3-h. p., 1-cu. yd. (SAE rated) tractor shovel is a time- and money-saver for every community — large or small. It has the versatility — with many quick-change attachments — to do virtually hundreds of different jobs. It lets you keep its operator busy, and it saves you the investment in other, more limited equipment. The Massey-Ferguson has the performance you need, too. It is equipped with Instant Reverse and Torque Converter — so you waste no time in backing up during loading or clean-up operations. It gets full payloads fast. Telescopic reach lets it dump over high trucks. See this "fleet-in-one" machine at your Massey-Ferguson Industrial dealer's now.

Why Wait? — Set a Date — We'll Demonstrate!

MASSEY-FERGUSON INDUSTRIAL DIVISION

Block 1000 South West St., Wichita 13, Kansas

Producing Sizeable Power for the "Sensational 60's"

MF60-21

A "Department of Urbiculture" Is Not Enough

When municipal officials gather to discuss mutual problems, someone generally proposes that the federal government establish a cabinet-level Department of Urban Affairs, or perhaps more exotically, of "Urbiculture." They often argue that the President now appoints secretaries to represent other vital interests in the nation's affairs; for example, commerce, labor, agriculture. Why then, not a department of urban affairs? We would not disagree.

Such a department could, for example, centralize the federally supported housing and home financing programs, now organized so loosely that one must be a specialist to understand them.

It could serve as an advisor on the Federal Highway Program, with veto powers over highway plans in urban areas, we would certainly hope.

It could provide for research and be a source of information on urban problems. Some 35 years ago, Harold S. Buttenheim, now Editor Emeritus of THE AMERICAN CITY, proposed to Herbert Hoover, who was then Secretary of Commerce, that an agency be formed in the federal government whose duty would be to provide information to local governments. This agency, Mr. Buttenheim envisaged, would try to answer accurately any question that a local government would ask. While Mr. Hoover looked with favor on the proposal at that time, it never materialized. Presumably a Department of Urbiculture could perform the same function.

However, despite these benefits, a federal department would not be able to overcome the fundamental road block that troubles most local governments. A city still is a "creature of the state," and sub-servient to it.

No edict from a federal department will force state legislatures to revise the debt limit under which their cities are forced to operate.

No federal memorandum will persuade a state legislature to reapportion its voting districts to give greater representation to its urban areas.

No recommendation from a federal department will be enough to encourage a state to give its cities greater home rule.

Incidentally, since Congress does enjoy a good meaty investigation, we suggest that a Congressional committee investigate the lack of home rule and the difficulties that this creates. We have a feeling that this investigation would be a popular one, better than TV quiz shows.

Why, for example, do cities in some states have to get special legislation passed for each parking lot they build?

Why do cities in some states have to get signed contracts for a public improvement before voting bonds, thus unnecessarily delaying work for from three to six months?

Why are so many cities forced to the more expensive revenue bond financing to build sewage purification plants? Why does a state force a city to build such a plant, and then refuse to give it power to finance it in the most economical manner?

Why, just out of curiosity, does a state insist that a city obtain state approval for a sewer that lies completely within the city's boundaries and serves only the people within the city?

The struggle for adequate representation, for home rule, for abolition of restrictive state legislation, cannot be sidestepped, but must be faced squarely within each state. It is a hard struggle, but one that can be and is being won.

To succeed, urban areas need good men representing them in state legislatures. They do not always get them. One expert on urban affairs has said that reapportionment, giving urban areas greater voice in state legislatures, would solve no problems. He has found that urban areas consistently send poorly qualified men to the state legislatures now and to send more second-raters would be no help.

This, then, is a spot where important work needs to be done by local governments themselves, not by a presidentially appointed cabinet officer. Cities, towns and villages need the best men they can get to represent them in their state capitals. The stakes in this contest are high.

Some have accurately described our local governments as "Democracy's Kitchen." If the state abuses this "kitchen" that has been entrusted to it, then the principles and effectiveness of democracy diminish.

If the state frees this "kitchen" from unnecessary restraint, gives it the strength and ability to work constructively as it should and wants to, then the urban areas will thrive and progress. And as they progress, then the United States, today an urbanized nation, will also thrive and progress. But, urban governments must work to get this freedom. The restraints will not drop away of themselves, nor will they disappear by presidential edict.

Stretching the long arm of the law in New Orleans

NEW ORLEANS, LA. — Here's a city that's growing by leaps and bounds. In fact, by total area (363.5 square miles) it's the nation's third largest. A fleet of 49 Harley-Davidson Solos range far and wide keeping law and order in this sprawling metropolis.

Harley-Davidson Solos get around more

...bridge the gap between you and trouble

Solo-mounted officers really do get around . . . around all obstacles. Nothing stops these mobile vehicles from getting through to the spot where they're needed — always poised to strike swiftly whether in crowded traffic or on busy expressways and fast-moving highways.

And no other police vehicle is more versatile. Use Solos on traffic control, criminal apprehension, residential and school patrol, daily emergencies, calamaties, special duty, parade and escort duty. With communities *spreading out* and at the same time *spreading thin* your personnel, it is this flexibility that allows you to get the most out of your equipment dollars.

The Solo for 1960 is better than ever. Mobile radio-phone, speedometer clock control, siren and pursuit lights are improved features — add teeth to law enforcement. Call your Harley-Davidson dealer. Or write Harley-Davidson Motor Co., Milwaukee 1, Wisconsin for informative new brochure, "Intensive, Effective, Impressive Police Mobility."

HARLEY-DAVIDSON

Police Motorcycles

OUR MUNICIPAL NOTEBOOK

Refuse hauling costs too high? In Laredo, Tex., the skillful location of a sanitary-fill site enabled the city to reduce truck hauls by 16 miles per round trip. The savings were more than double the cost of the equipment needed to operate the fill.

The city uses two International TD-14A tractors with Drott Bullclams; one also has a hydraulically operated scarifier. The city's sanitary-fill program has produced a neighborhood playground out of what was once wasteland; it has reclaimed an area that once was an old gravel pit; and it is permitting beautification of a 35-acre wasteland near the International Bridge leading to Nuevo Laredo, Mexico.

* * *

If golf courses look green in California, the reason may be that the local sewage-purification plant is providing the irrigation. A public course in El Cajon uses purified sewage effluent, as do the courses operated by the Marine Corps at Camp Pendleton, El Torro, and Nebo, and the U. S. Naval Ordnance Test Station at China Lake.

* * *

Water mains too small? If water shortages threaten, you may need more and bigger water mains—but you may need only to clean the old ones. In Norfolk, Va., Water Engineer Arthur C. Freeman III directed the cleaning and lining of one 20-inch and 16-inch line in a strategic location, and boosted its capacity 225%. The work was done by the National Water Main Cleaning Company and the Centriline Corporation of New York.

* * *

Killer gas appliances in your city? Cincinnati doesn't believe in letting its citizens run the risk of death from dangerous gas appliances. Its city ordinance has these features:

- *requires all heaters to be vented through proper chimney connections.*
- *forbids the sale of any heater which is not vented and which is not approved by the American Gas Association.*
- *empowers the Air Pollution Control Bureau to seal out-of-service hazardous gas heaters.*

Cincinnati's Air Pollution Control chief, Charles W. Gruber, equips his inspectors with a Mine Safety Appliance carbon-monoxide tester to determine the hazard in suspected heating equipment.

* * *

The sweeper was free. Napa, Calif., acquired a big machine sweeper a few years ago that paid for itself in the first year. Director of Public Works Carl F. Lynch found that a three-yard Wayne with one operator was able to do the work that in the past had been done by one sweeper, one operator, one truck and two laborers. Furthermore, the new machine proved able to do the same work in eight days that formally required ten. The key to the saving is in the ability of the sweeper to carry its three-yard load to a central dumping spot, traveling with the hopper loaded at 25 miles per hour.

Napa now has two sweepers. The city operates one full time in the central business district each morning. During the summer months the machine follows the flusher truck as it washes the downtown area daily. The other is used in the spring and early summer every other day (Monday, Wednesday, Friday). During the fall the city operates both full time to pick up leaves from its 9,000 street trees. The sweeper averages 34 curb miles per day.

* * *

The longest fluorescent-lighted street in America is New York City's Third Avenue. It has 539 units spaced at 100-foot intervals on alternate sides of the street. Each of the Westinghouse luminaires houses four 72-inch 100-watt fluorescent lamps. Each light fixture is mounted 26 feet above the street on Kerrigan galvanized-steel standards. They are designed to provide 0.8 of a foot-candle of illumination per square foot of street.

If you want more information on these topics, or any other municipal problem, drop a note to:

The Editors
THE AMERICAN CITY
470 Park Avenue South
New York 16, New York

Coffee break in city hall? Of some 300 cities polled, 44% authorize the breaks, 52% do not officially recognize them but do permit them; only 4% prohibit them. Administrators seem to feel that the break is something of a symbol that the employee is an individual who can be trusted and who does not need to be considered an impersonal cog in the municipal machine.

* * *

Troubled with lipstick smears in women's public restrooms? Park Superintendent William M. Van Hook, Rochester, Minn., has whipped this bugaboo by painting the walls a flame red color.

* * *

A drive-in pay window has been a big help in speeding utility payments in Camden, South Carolina. The City Manager reports that approximately one-third of the city's utility customers use the drive-in facilities.

* * *

How do you prepare water bills? Anyone who still believes in keeping water bills by hand ledger will have a hard time arguing with James J. Mima, assistant director of the Inglewood, Calif., Water Department. His department switched to use of an Underwood Sundstrand billing machine during a period when the population jumped some 30%.

The department found that it could prepare a better bill, one more easily understood by the water user, without having to increase bookkeeping personnel.

* * *

Did you ever try flushing your downtown sidewalks at night to give them spick-and-span cleanliness in the morning? Fort Worth, Tex., has been doing this during the summer months for many years, finds it one of the most popular projects that the city has undertaken. Street Superintendent H. H. Hester assigns a crew consisting of one flusher operator and two laborers who work four nights a week. They use a flusher with a hinged bracket and a 25-foot extension that carries a 1½-inch hose, elevated to clear parked cars.

Grant County, Wisconsin, buys its first tractor-scraper... all-purpose Cat No. 619 with No. 442 Scraper

"This rig has more features than anything we looked at in its class. More power, speed, maneuverability"

George Hudson, Construction Supt.

To keep an 8 to 10 mile per year road building program on schedule, Grant County needed a fast, compact mobile earthmover for use on longer hauls and larger yardages. After testing competitive rigs, a demonstration sold the county on a Cat No. 619 with matching No. 442 Scraper. Reason: it has more "bonus features" than any other machine in its class.

First assignment for the No. 619—relocating a half mile of road to eliminate a bad curve. 14,000 cu. yd. had to be removed to make a 14-ft. cut. The job proved to be a stop-and-go affair—haul distance 375 ft.—with tough material—sand, rock and clay so stubborn that much of it needed ripping. The No. 619's lugging ability and easy handling on sharp turns pay off. And on longer hauls, Superintendent Hudson reports the No. 619 "climbs up a 5% grade in 4th gear with a good load."

Here are some reasons why the No. 619-No. 442 is an "all job" rig loaded with performance. A Turbocharged Cat Engine delivers 225 HP and high torque rise for fast acceleration and lugging power under capacity loads. The LOWBOWL Scraper handles 14 cu. yd. struck . . . 18 cu. yd. heaped. The No. 619-No. 442 team has 30 MPH *usable* operating speed . . . hugs the ground for roadability found in no other 2-wheeled earthmover of its capacity. Newly developed 2-jack hydraulic steering gives effortless maneuverability yet retains "feel of the road" control. This advance steering permits full 90° turns in a diameter of 30 ft.

Get the full story on this hurry-up, all-purpose rig from your Caterpillar Dealer. Ask for a demonstration under the job conditions you face. See why this machine is the wisest investment for your taxpayers' money.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NO. 619-NO. 442 FOR "ALL JOB" VERSATILITY

Prefabricated slabs were hauled to the job and placed into position on the reconstructed beams. The joints were sealed with asphalt. Note the telephone conduit (left) placed immediately after the removal of the old walk.

Bridge Walk Replaced With Prefabricated Slabs

Repairing the walk on the First Avenue North Bridge in Great Falls, Mont., actually amounted to complete reconstruction because of a weight problem. When constructed in 1919 the walks on both sides of the bridge were elevated seven inches above the street surface. Maintenance and resurfacing of the roadway over the years (a function of the State Highway Department) brought the level of the roadway to that of the walks. Drainage, dirt and debris from the roadway collected on the walks, making it practically unusable for pedestrians during wet weather. Maintenance had become an expensive and troublesome problem.

This condition had to be corrected, for the bridge serves as an important link between East and West Great Falls, carrying a large volume of both vehicular and pedestrian traffic. Because of limited funds, the City Council approved plans to improve the walk on one side only.

Prefabricated Construction

The simplest and most economical way to solve the problem consisted of adding a six-inch or eight-inch concrete slab to the existing walk. However, the State Highway Bridge Engineer rejected this plan because it would place an excessive dead load on the cantilever beams supporting the walks. We then turned to prefabricated construction.

The contractor first removed the existing walk to eliminate the weight problem and replaced it with a relatively light-weight prestressed slab. The local telephone company took advantage of the situation by installing conduit for future cables across the river at very little expense.

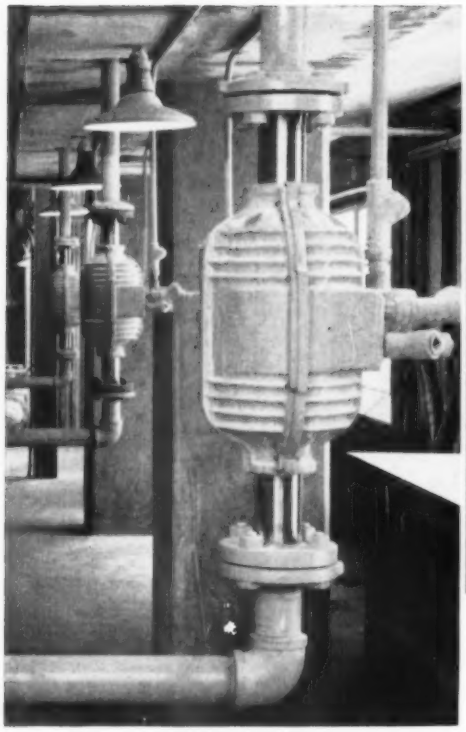
The twin-tee sections, all 2 inches thick by 3½ feet wide (three feet from center to center of the legs) came in three lengths. The complete job took 28 sections 38 feet long, 14 sections 32 feet 3 inches long, and 14 sections 22 feet 9 inches long. Slab reinforcing consisted of 6 x 6-inch 6/6 fabric and the pretension steel consisted of 7/16-inch strands.

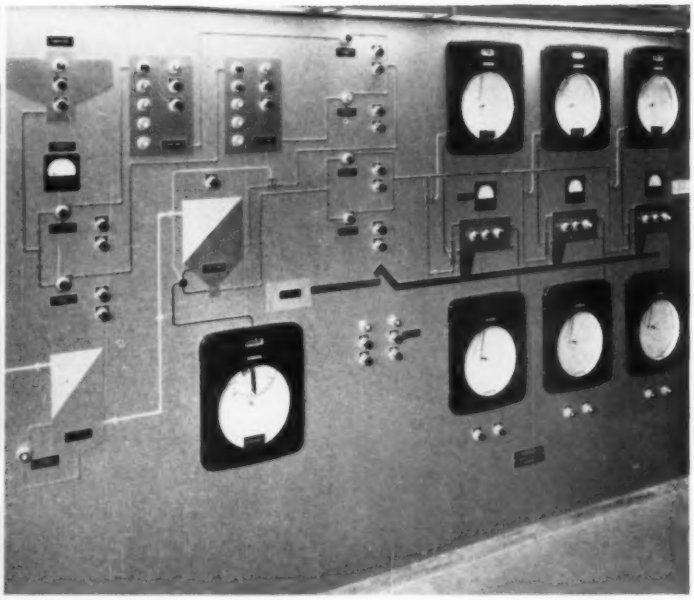
Two sections laid side by side made up a seven-foot walk, with a new curb six inches at the top and eight inches at the bottom placed between the inner walk edge and the roadway. The new walk slopes toward the roadway and is nine inches above it at the curb line. Adequate drainage provided by openings along the gutter line solved the water problem.

We awarded the contract to Falls Construction Company of Great Falls on February 9th, 1959 and work started on March 15th. The job was completed on June 1st. The Pappin Prestressed Concrete Company of Great Falls supplied the prestressed members. The project, financed by the City of Great Falls and the County of Cascade, cost $28,000. The City Engineering Department designed the project and inspected the work.

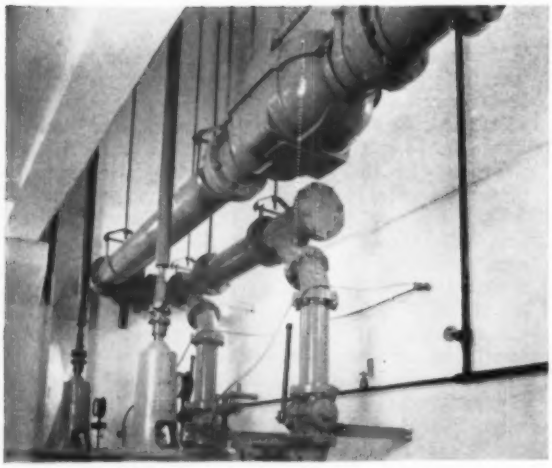
C. R. Hanson
City Engineer
Great Falls, Mont.

Foxboro Magnetic Flow problems for





DAYTON, OHIO Three Foxboro Magnetic Flow Meters measure flow of sludge to centrifuges at Dayton's Lime Recalcining Plant. Designed around these meters, plant actually recovers up to 20% more lime than originally added to water. Graphic control panel in Feed End Building operates entire plant.



NEWPORT, R. I. At Newport, R. I. influent at the main sewage plant comes from both the town and a nearby Navy base. Determining how much of the total should be billed to the Navy is the job of the Foxboro Magnetic Meter and Foxboro Dynalog Recorder shown above.

Meters eliminate line restriction these municipal utilities

Introduced six years ago, the Foxboro Magnetic Flow Meter has proved its superiority for measuring water, sewage, sludge and other treatment plant flows.

Foxboro Magnetic Flow Meters have no flow restrictions of any type. No taps to get plugged or frozen, no seals or purges, no moving parts of any type. Measurement is made by electrodes flush-mounted in meter wall — then transmitted by electric cable to a Foxboro Dynalog* electronic recorder. Accuracy is ±1%.

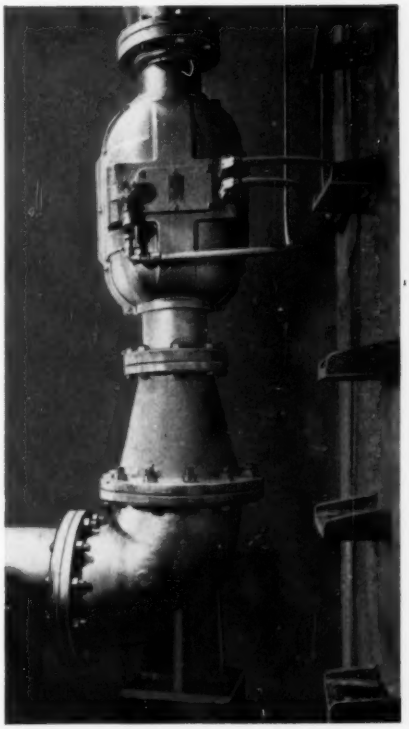
Foxboro Magnetic Flow Meters have solved some of the toughest municipal measurement problems. Ask your Foxboro field engineer to show how it can help with yours. Or write for Bulletin 20-14. The Foxboro Company, 953 Neponset Avenue, Foxboro, Massachusetts.

*Reg. U. S. Pat. Off.

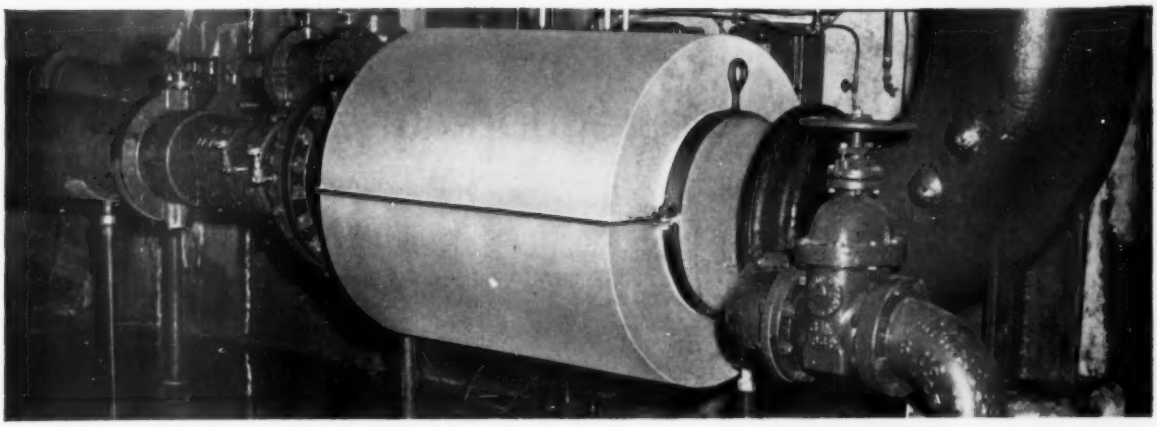
Partial List of Progressive Communities Using Foxboro Magnetic Flow Meters

Benton Harbor, Michigan	— raw sewage
Hayward, Calif.	— water
Pittsburgh, Pa. (Allegheny County Sanitary Authority)	— raw sewage
Covington, Ohio	— return activated sludge
Medfield, Mass.	— water
Orange County, Calif.	— sewage
Warren Township, Michigan	— raw sewage and sludge
Bloomfield Township, Michigan	— water
Seattle, Washington (Lake City Sewage Plant)	— sludge
Milwaukee, Wisconsin	— sludge
Piqua, Ohio	— sludge
Arkansas City, Kansas	— sewage
Sidney, Ohio	— return activated sludge
Frazer, Michigan	— raw sewage

Meter sizes on these installations range from 3 inches to 6 feet.



FARMERS BRANCH, TEXAS Eight-inch Magnetic Flow Meter at a sewage lift station. Meter was installed below ground level, right next to elbow and valve, without affecting its measurement accuracy.

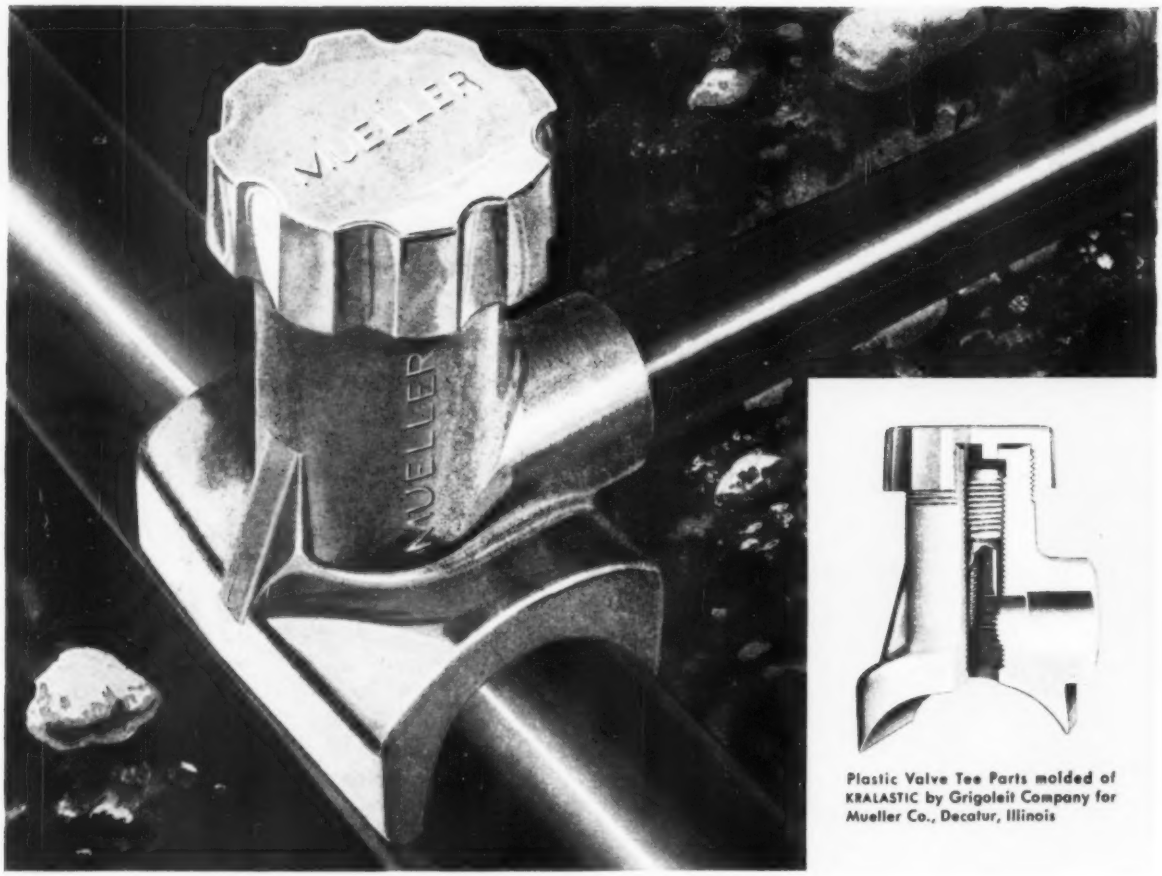


CHICAGO, ILLINOIS This 20" Foxboro Magnetic Flow Meter was installed in the South District Filtration Plant in April, 1956. Because it has no line restrictions, plant officials knew the meter would add no more pressure drop than an equivalent length of pipe. Note how it was installed directly downstream from an elbow.

FOXBORO

REG. U.S. PAT. OFF.

Naugatuck KRALASTIC®



Plastic Valve Tee Parts molded of KRALASTIC by Grigoleit Company for Mueller Co., Decatur, Illinois

KRALASTIC valve tee now makes safe connections under pressure!

This new Mueller valve tee reflects a careful and intelligent application of material and design...not the least sign of which is the use of KRALASTIC for the tee body, cap and plug. (Pilot screw and cutter are of stainless steel.)

KRALASTIC is the unique rubber-resin blend that has proved so outstandingly successful in oil, gas, water, and chemical pipe and fittings that more than 9,000 miles of KRALASTIC systems are already in use. And here in this valve tee KRALASTIC has particular advantages, beyond the fact that it forms a perfect mate to the many miles of KRALASTIC in gas mains.

Because the unit contains a built-in cutter to permit tapping a plastic main under pressure, strength and dimensional stability are of unusual importance. And the use of clamps and drilling tools for installation adds further to the need for toughness, a feature in which KRALASTIC is exceptional.

Look for KRALASTIC not only in pipe and fittings, but in tool handles, machine housings...any place where toughness, strength, light weight, dimensional stability and freedom from corrosion are an asset. For more information on KRALASTIC pipe and fittings, or on KRALASTIC for other applications, write us today.

United States Rubber
Naugatuck Chemical Division
DEPT. 344K ELM STREET
NAUGATUCK, CONNECTICUT

KRALASTIC RUBBER-RESINS • **MARVINOL** VINYLS • **VIBRIN** POLYESTERS

Akron · Boston · Chicago · Gastonia · Los Angeles · Memphis · New York · Phila. · CANADA: Naugatuck Chemicals · Elmira, Ont. · Cable: Rubexport, N.Y.

AWWA Nominates Officers

W. J. Orchard | C. F. Wertz | J. W. Cramer

The Board of Directors of the American Water Works Association, at its annual meeting held in New York, nominated the following men for the office of President, Vice President and Treasurer:

For President: C. F. Wertz, director of the Department of Water and Sewers, Miami, Fla. Mr. Wertz, now serving as Vice President of AWWA, has been a member since 1924. He served as vice-chairman of the Florida section in 1946, chairman in 1947, and from 1951 to 1954 represented that section on the Association's Board of Directors. He has received the Association's George Warren Fuller Award.

For Vice President: John W. Cramer, partner in the consulting engineering firm of Fulton and Cramer, Lincoln, Neb. Mr. Cramer joined the Association in 1947, served as secretary of the Association's Nebraska section from 1948 to 1951, and represented that section for a three-year term on the Association's Board of Directors. Mr. Cramer also received the Fuller Award.

For Treasurer: William J. Orchard, retired general manager of Wallace & Tiernan, Inc., Belleville, N. J. No newcomer to AWWA, Mr. Orchard is presently completing his third term as the Association's Treasurer. He has been a member since 1917, serving four three-year terms as a director. He was made an Honorary Member in 1937 and, in 1954, received the John M. Diven Medal for outstanding service to the Association. In 1956 he received the Harry E. Jordan Achievement Award.

The 80th annual conference of the American Water Works Association, at which time newly elected officers take office, will be held at the Americana Hotel, Bal Harbour (Miami Beach), Fla., from May 15th to 20th. The tentative program calls for two general sessions, 14 technical sessions and a series of committee meetings focused mostly on how to meet increasing problems stemming from unprecedented surges in population and water use.

Mark Twain Would Remember This Pipe Line

Hannibal, Mo., boyhood home of Mark Twain, has joined the Cast Iron Pipe Association's Century Club. Marking the centennial of the city's first cast-iron gas main, ceremonies in front of the author's home included the participation of two of Twain's most beloved characters, Tom Sawyer and Becky Thatcher. Two local youngsters, William A. Hoffman and Cheryl Greening, were selected to represent the fictional children.

William (as Tom) holds a section of the main, laid in 1859 and still in use, as Norman Wakeman, editorial director of the association, presents Hannibal's Century Club membership plaque to Mayor Clyde Toalson.

Taking part in the presentation are (left to right): F. T. Russell, executive director of the Hannibal Chamber of Commerce; Mr. Wakeman, Mayor Toalson, Cheryl Greening, William Hoffman, and E. D. V. Dickey, who, for 40 years, has been the manager of the Citizens' Gas Company, Hannibal.

Nearly 100 cities now have cast-iron gas or water mains that have been in use for more than a century. The oldest cast-iron pipe in the U. S. was laid in Philadelphia 140 years ago.

"We carry up to 2,500 lb. more FORD Tandems and still outrun

SAYS HARRY R. KUNZ
PRESIDENT, KUNZ PAVING CO.
SAN MATEO, CALIFORNIA

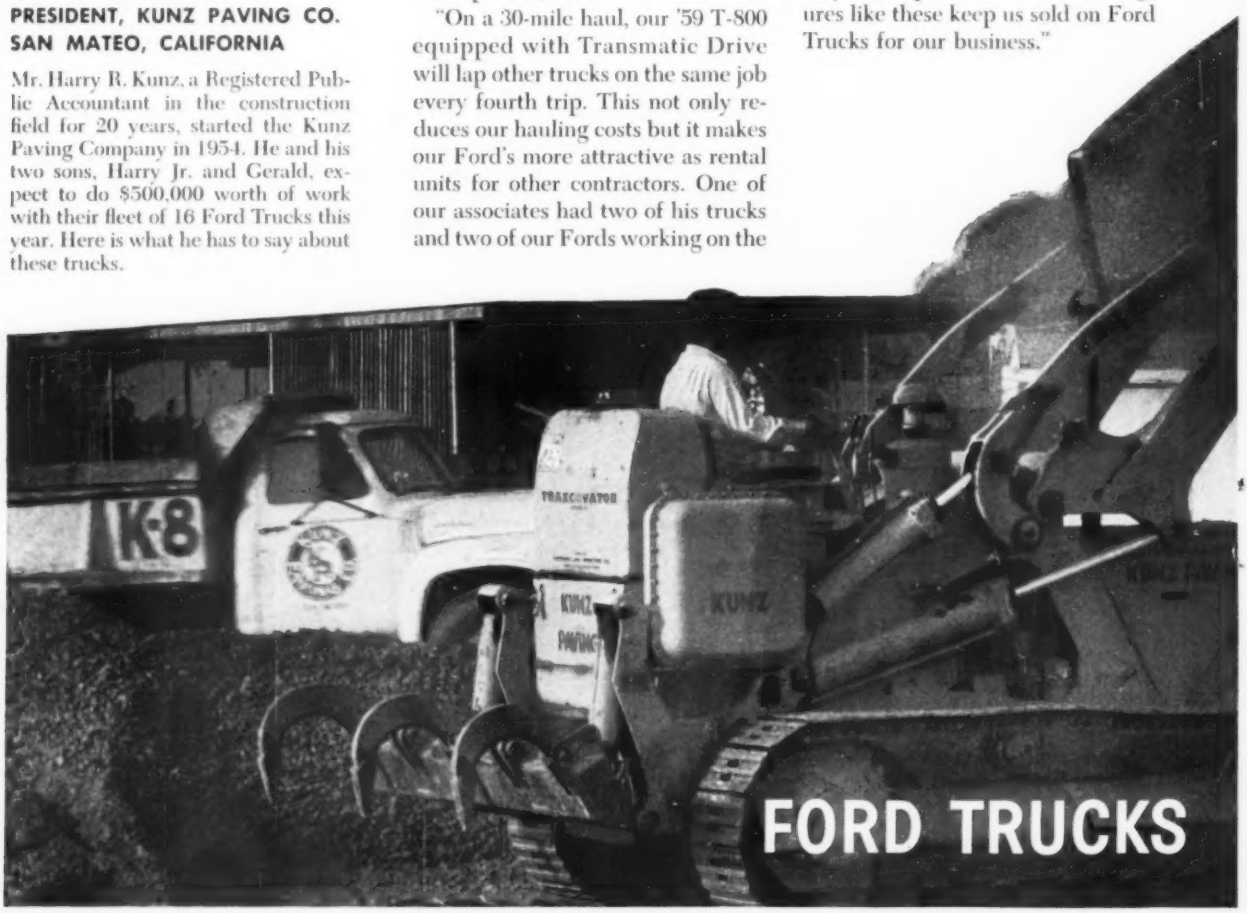
Mr. Harry R. Kunz, a Registered Public Accountant in the construction field for 20 years, started the Kunz Paving Company in 1954. He and his two sons, Harry Jr. and Gerald, expect to do $500,000 worth of work with their fleet of 16 Ford Trucks this year. Here is what he has to say about these trucks.

"Our experience with Fords has proved them to be the best all-around truck we can buy! They haul more payload, cut down considerably on trip time and cost less to operate and maintain.

"The lighter chassis weight of the Ford Tandems lets us carry as much as 2,500 pounds more than competitive makes. This extra payload means that we can haul as much in ten trips as the others do in eleven. Our Fords will beat them on a trip-for-trip basis, too!

"On a 30-mile haul, our '59 T-800 equipped with Transmatic Drive will lap other trucks on the same job every fourth trip. This not only reduces our hauling costs but it makes our Ford's more attractive as rental units for other contractors. One of our associates had two of his trucks and two of our Fords working on the same job. He actually paid for the rental of our trucks by the extra trips they made.

"Our cost records, set up on an hourly basis to make it easier to prepare bids, show that the longer life built into Ford Trucks makes them less costly to operate. We have one '56 Ford T-750 with over 100,000 miles on it that we use as a base for our tandem hauling costs. In spite of its high mileage – gas, oil, tires, maintenance and repairs amount to only $2.08 per hour. Facts and figures like these keep us sold on Ford Trucks for our business."



payload on our other trucks on the same job!"

Again in '60... FORD PICKUPS beat all leading makes in Gasoline Economy!

Ford Six delivers 13.1% better gas mileage in second running of Economy Showdown U.S.A.* Standard 1960 ½-ton pickups of the five leading makes were purchased from dealers just as you would and run both empty and loaded, over flat terrain and hills, at low and high speeds, under city traffic and retail delivery conditions.

Certified results show the Ford Six won *every* test—with a combined Ford advantage for all tests of 13.1% more mpg than the average of the other makes tested. In fact the Ford Six beat one competitive pickup by a whopping 27%.

The 1960 Fords not only deliver the best gas mileage of the leading makes—but they do it without sacrificing any of the performance characteristics for which Ford is famous. And, this year, if you buy a Ford instead of a competitive truck, you can be sure to save!

Check the certified records for yourself in your Ford Dealer's "Certified Economy Reports" . . . see and drive the new Ford Trucks . . . check the price tags . . . *and you'll save for sure!*

*Over-all economy test conducted by America's leading independent research organization (name available on request)

COST LESS

LESS TO OWN . . . LESS TO RUN . . .
BUILT TO LAST LONGER, TOO!

(Continued from page 5)

bulk storage is much less than that of a business machine and such operations as sorting or merging are not required.

So far, no municipality has indicated interest in the RCA-110 industrial computer. Municipalities who operate their own power generating plants will undoubtedly become interested in the automation of start-up and shut-down processes in these plants. Applications for the automation of involved control processes by computers are being discovered almost daily and, therefore, municipalities operating public utilities will become users. Some cities have already installed computer-operated, centralized traffic control systems.

As indicated by the articles already published in THE AMERICAN CITY, many of our larger cities have already adopted electronic data processing to handle their accounting. Our RCA-501 system is specifically designed for such work and is offered in a wide range of sizes so that it meets the requirements of both the medium and large city.

We appreciate your interest in RCA and in the modern approach to business and industrial automation. I'm sure that your readers appreciate your articles on the adaptation of electronic data processing to their needs.

D. H. KUNSMAN
Vice Pres. and Gen. Mgr.
Electronic Data Processing Div.
Radio Corporation of America
Camden, N. J.

Street Capacities

I am writing in reference to a table in the Traffic Control Section of THE AMERICAN CITY for November 1959, p. 131. The table contains practical capacities of downtown streets versus street widths. The first line of this table indicates capacities for a street width of 39 feet under various conditions. For this particular width the indicated capacities appear to be very low. Other references, and the *Traffic Engineering Handbook* in particular, bear this out.

After plotting the figures prescribed in the table, I find that if the street width is 30 feet instead of 39 feet, all four of my curves are much smoother and are in agreement with curves found in other references.

If this is indeed an error, it should be corrected, or if it is based on new research, I would like to know the source.

MICHAEL MCGOVERN
Assistant Engineer
City of Eureka, Calif.

EDITOR'S NOTE: This was a typographical error. The original copy read: "30 feet."

Four Cities Win Anti-Noise Awards

Memphis, Tenn., Philadelphia, Pa., Cincinnati, Ohio, and Jacksonville, Fla., received awards from the National Noise Abatement Council for outstanding effort in combatting excessive noise during 1959.

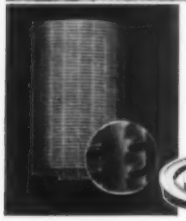
Memphis and Philadelphia were given bronze plaques, the highest award given by the Council to cities, and Cincinnati and Jacksonville were granted "Certificates of Award."

The plaques and certificates are given annually on the basis of effective observance of Noise Abatement Week, which the Council sponsors, and on documented evidence of a year-round noise control effort by the city.

DOWN she goes!

All brass and 2 feet wide, this 20-foot Cook Strainer is being lowered into a 125-foot well at a large Kentucky distillery. A No. 30-slot, Wire Wound Strainer was specified for this job by the Diehl Pump & Supply Co., Louisville.

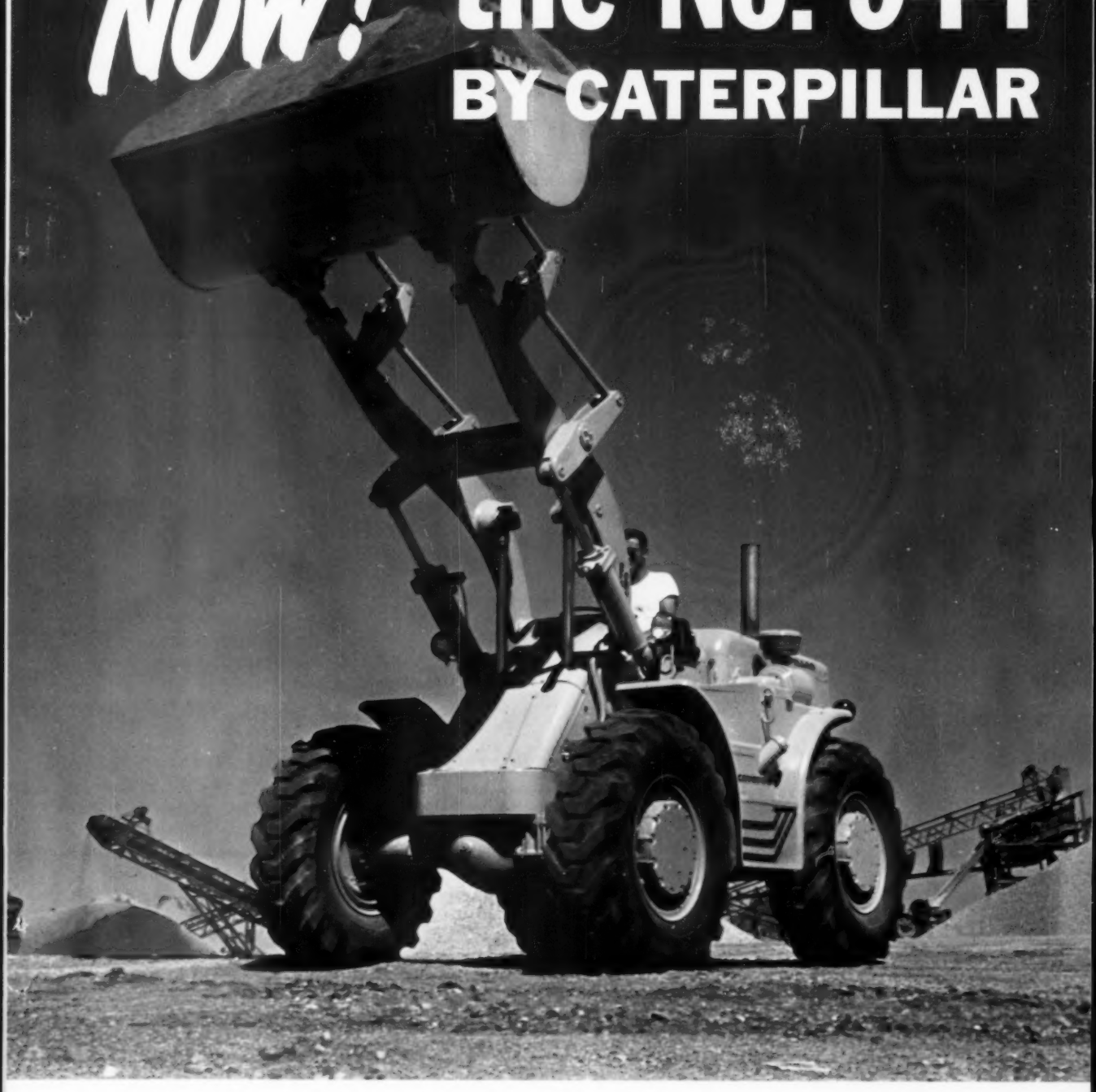
Over the long-pull, this well will **continuously** deliver silt-free, sand-free water at the rate of 750 GPM. The Cook Strainer's exclusive V-shaped, self-cleaning slot makes dependable performance like this possible. Larger inside than out, the V-shaped slot prevents clogging—guarantees maximum delivery by filtering out silt, alluvium, clay, and fine sand from around the outside of the strainer. The result—maximum development with a free, **unobstructed** flow of water, for years to come. Investigate for yourself the advantages of Cook Well Strainers. They are available in Wire Wound and Brass Tube types, with slot sizes as required, in all standard diameters.



Made from Red Brass, Silicone Bronze, Armco Iron, and Stainless Steel. 8 to 24 hour delivery often possible by telephoning Cincinnati, HUmboldt 1-8800.

COOK WELL STRAINER CO.
6330 Glenway Avenue • Cincinnati 11, Ohio
WORLD'S LEADING NAME IN WELL STRAINERS

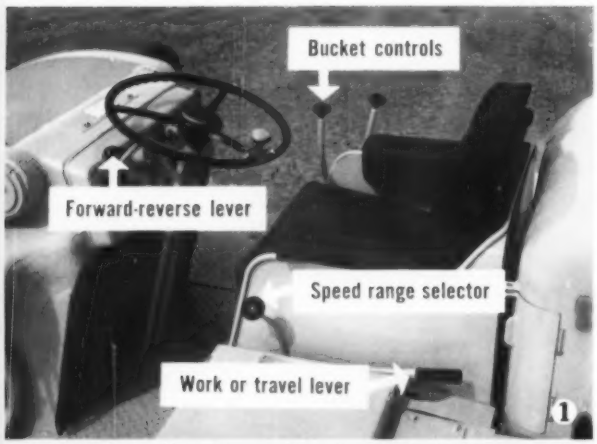
NOW! the No. 944
BY CATERPILLAR



THE *FIRST*
OF A NEW WHEEL LOADER LINE

the No. 944

...designed for action,



IT'S HERE . . . the Cat No. 944 . . . rated at 2 cu. yd. capacity . . . the first of a completely new line of equipment that will soon include the No. 922 (1¼ cu. yd. bucket) and the No. 966 (2½ cu. yd. bucket).

Watch for these new machines with the bold new design . . . they're ready to bring new standards to wheel loader operation.

Take a look at the No. 944's big, new features . . . features that give it lively response and make it the easiest and safest wheel loader to operate. See it in action at your Caterpillar Dealer. Ask him for a demonstration. See for yourself how the *new design* pays off on your loader jobs.

DESIGNED FOR ACTION . . . with plenty of power for both machine drive *and* bucket hydraulics. Choose from two great, new engines . . . the compact 4-cylinder diesel, turbocharged for maximum efficiency . . . or the 6-cylinder gasoline engine. Both are 105 HP units, fully equipped. Both are made to the same rigid standards. Whatever the requirements of your operation, there's a No. 944 powered to meet your needs.

Tailored to this power is the torque converter and power shift transmission, providing smooth, instant, finger-tip shifting. A full range of work and travel speeds is available on the No. 944. And reverse speeds are 25% faster than forward speeds . . . important in reducing cycle times. Travel Range gives 2-wheel drive for roading . . . Work Range automatically puts power to all 4 wheels.

Machine and bucket controls are located for easy handling(**1**)—the forward-reverse lever is mounted on the steering column.

Both bucket control levers have kick-out devices. The lift control releases at dumping height—the tilt control positions the bucket for digging. And for full bucket loads every pass the 2 cu. yd. bucket tilts back 41° at ground level. The high lift and *extra-long reach* make truck loading faster, easier.

There's plenty of action designed into the No. 944, ready to speed up your loader jobs.

DESIGNED FOR SAFETY . . . in the bold new lines(**2**). Bucket lift arms and pivot points are completely in front of the operator's area. This gives the operator new freedom of movement . . . greater all-around visibility.

Wide steps(**3**) make it safe and easy to get on or off . . . from either side. No need to climb over tires. Fenders provide a handy platform for checking the engine and they protect the operator from rocks and mud(**4**).

The No. 944 brake system gives safer, more precise control(**5**). The *left* brake neutralizes the transmission *as* it stops the machine. This gives superior loading action in extra-tough material.

Traxcavator safety, economy

The *right* brake leaves the transmission engaged . . . for full control when creeping, working on steep slopes or roading downhill.

These and other safety-bonus features give the No. 944 operator greater confidence, greater efficiency.

DESIGNED FOR ECONOMY . . . in the Caterpillar tradition. Sound engineering, modern design, service accessibility, quality construction, responsible parts and service coverage all add up to a new kind of stability—mechanical stability—in the No. 944. The many cost-saving features of this NEW wheel loader will pay off big in your operation!

Offered in a full line of versatile attachments and accessories are forks, cab(**6**) and special buckets, including the *exclusive side dump* that gives the No. 944 added efficiency.

BRIEF SPECIFICATIONS

Horsepower (Net)	105*
Bucket capacity	2 cu. yd.
Bucket reach (@ 7 ft. dump height)	50¾ in.
Over-all width (bucket)	93½ in.
Wheel base	88 in.
Speeds, forward (4)	0-24 MPH
reverse (4)	0-30 MPH
Weight, shipping (with diesel engine)	20,780 lb.
(with gasoline engine)	20,440 lb.

* For comparative purposes, the maximum rating of the D330 Engine used in the No. 944 is 135 horsepower.

6

THE No. 944 TRAXCAVATOR...

NEW IN DESIGN AND
LOADED WITH PERFORMANCE

Learn more about it. Visit your Caterpillar Dealer the week of March 14

There's a wealth of LOADER KNOW-HOW behind the No. 944. It comes from the builders of the best accepted track-type tractor-shovels in the field.

Every feature is designed for *efficient work*. Plenty of horsepower . . . finger-tip shifting . . . smooth, fast bucket action . . . outstanding operator comfort and safety. The result is the bold, new No. 944 . . . the *outstanding* performer in its class!

For complete facts, see your Caterpillar Dealer now.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

DIESEL ENGINES · TRACTORS · MOTOR GRADERS
EARTHMOVING EQUIPMENT

A GREAT NEW PRODUCT IN THE CATERPILLAR TRADITION

quickly installed in old piping!

MUELLER copper meter yokes

NEW compression couplings

. . . for steel or copper pipe

. . . with or without locking nut

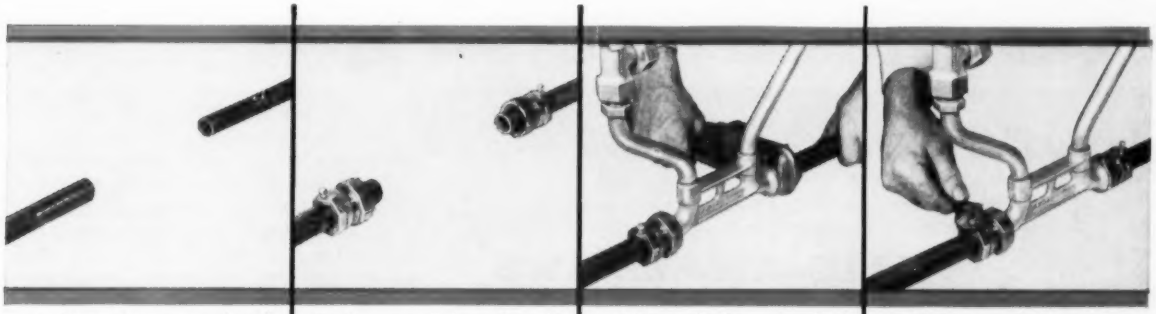
You can now install Mueller Copper Meter Yokes in any existing steel or copper piping in just a few minutes — and without cutting threads or sweating joints.

The simple step-by-step procedure for installing a yoke with Mueller's new Compression Couplings is shown below. Permanent, water-tight joints are quickly made even on rough and badly pitted pipe. Possible trouble is avoided because the piping does not have to be moved.

These new, time-saving couplings are now available for all Mueller Copper Meter Yokes with Multi-Purpose Ends. Regular compression nut or locking nut designs can be furnished for steel or copper pipe.

The locking nut type (shown) positively prevents any movement of the yoke on the pipe and insures continuous electrical bonding of the service piping.

Write for complete information and specifications on Mueller's Copper Meter Yokes.



1 Clean dirt, rust and scale from pipe and cut out a section just slightly longer than yoke (without coupling).

2 Remove all burrs from inside and outside of pipe and slip complete coupling over cleaned ends of pipe.

3 Align yoke between ends of pipe, slide couplings into place and tighten couplings securely onto yoke body.

4 Tighten compression nuts on pipe and lock yoke in place by tightening locking set screw on clamp. Setting complete.

Copper Meter Yokes are just a portion of Mueller's complete line of quality-matched meter setting equipment.

MUELLER CO. Since 1857 SERVING the Water and Gas Industries QUALITY

MUELLER CO.
DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario.

LONGER WHEELBASE...

It still turns tighter!

There's no sacrificing stability for short turning radius with an Allis-Chalmers utility tractor! They *have* rock-solid stability because *longer* wheelbase keeps their weight spread out. You get more feet on the ground.

Power-shift rear wheels and adjustable front axles widen out for greater stability on slopes . . . or narrow up for better maneuverability in tight quarters.

Get all the facts on Allis-Chalmers' practical engineering by mailing the coupon below. Remember, it doesn't cost to find out!

D-10 • D-12 • D-14 • D-17

Utility tractors from 31 to 63 engine horsepower with companion equipment to match your needs!

ALLIS-CHALMERS

60-6

ALLIS-CHALMERS MFG. CO
Utility Tractors & Equipment, Milwaukee 1, Wisconsin

Please send me more information about Allis-Chalmers utility tractors with ☐ backhoe ☐ loader ☐ fork lift

Name_____

Firm_____

Address_____

City_____ State_____

SOLD BY ALLIS-CHALMERS DEALERS EVERYWHERE

Not Necessarily H_2O

If anyone still thinks that all water molecules conform to a simple combination of two atoms of hydrogen to one of oxygen he should have listened to Frank E. Clarke, industrial water expert, U. S. Naval Engineering Experiment Station. He spoke at the Industrial Water Industry Luncheon recently at the American Society for Testing Materials 3rd Pacific Area National Meeting in San Francisco.

With the aid of colored charts, Mr. Clarke presented the most modern concepts of the structure of the water molecule, starting with the probable structure of the basic components — hydrogen and oxygen atoms. Including possible combinations of ordinary hydrogen, deuterium, or tritium with oxygen isotopes having atomic numbers of 8, 9, 10, or even 11, Mr. Clarke said that at least 18 different varieties of water molecules have been shown to exist, even without counting any of the compounds of the short-lived oxygen-19 (less than 1 min. half life). A starting concept of the water molecule was presented on the basis of "evidence that each body of water, even the ocean, is a single gigantic molecule or lattice, which might be written $(H_2O)_n$."

Recent submarine explorations under the polar ice cap have disclosed that large amounts of fresh water are to be found in layers 10 to 12 feet thick under the ice. These layers presumably have resulted from the self-desalting of sea water by fractional crystallization and stratification.

He emphasized striking differences between the different kinds of water. For example, heavy water (deuterium oxide) will not quench thirst, will not support certain plant life, but is useful as a neutron moderator in fission reactions to slow up neutrons to the optimum velocity for production of fission effects.

He also disclosed new and potential uses of water. Now that submarines can remain under the sea for very long periods, sea water itself is desalted and then electrolyzed to provide oxygen for breathing. Ocean water is a storehouse of minerals, more and more of which will ultimately be found to be economically recoverable. The most striking prospective use of all was described as the possibility of separating from water the traces of deuterium and tritium and then using them in controlled fusion processes that would result in the greatest potential energy supply on earth.

cuts wear and noise at the water level

It's standard on all Badger Disc meters. Dovetail thrust roller insert fits vertically into the thrust roller slot to form a smooth track on which the roller rides countless times — quietly without wear. With the slot 77% shorter, original strength is retained and possible distortion in this area is eliminated.

Accurate registration is constant because the nutating disc never shifts position. After many years of service an inexpensive insert can be replaced if necessary (instead of a possible chamber replacement).

The dovetail thrust roller insert is just one of many refinements to emerge from Badger's concentration on *meter* research and development. For further details, see your Badger representative. Ask him, too, about the new Read-o-Matic outdoor meter-register. Proof that answers for better water metering come first from Badger.

BADGER'S BIG PARADE OF PRODUCTS FOR BETTER WATER METERING

Badger Water Meters

BADGER METER MFG. CO. • 4545 W. Brown Deer Rd., Milwaukee 23, Wisconsin • *Offices in Principal Cities*

New Mack 750-gpm triple-combination pumper delivered to Peebles District Fire Company, McCandless Township, Pa., features 750-gal. booster tank . . . 250-gpm auxiliary pump . . . 500 ft. of 1" hose . . . 10-ton front-mounted winch . . . front-mounted, cab-controlled spray nozzles . . . aluminum ladders. Vehicle is powered by 276 hp Mack Thermodyne® engine, has exclusive Mack four-wheel Balanced Bogie that delivers power equally to wheels having traction for pulling power in rough going, and is equipped with air brakes.

Mack fire apparatus for modern fire protection

Part of the constant improvement in fire-fighting techniques is the increasing reliance on apparatus that can stand up to modern demands. This means that more and more progressive paid and volunteer departments rely on Macks for outstanding dependability.

The reason for Mack leadership is obvious. Mack builds more of the vital components of its fire apparatus than any other maker. Thus Mack can best meet your exact fire-fighting needs.

Engines, frames, transmissions, front and rear axles, including the tandem-axle Mack Balanced Bogie with Power Divider interaxle differential for automatic transmission of power to the axle with the most traction—all these are built in Mack's own plants for Mack fire apparatus.

Next time you consider apparatus, compare Mack design and construction with all others. You'll know you're getting the best when you specify Mack. Mack Fire Apparatus, Allentown, Pennsylvania. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ontario.

MACK

FIRST NAME FOR

FIRE APPARATUS

COMPLETE LINE OF PUMPERS—500 to 1250 GPM . . . SQUAD AND HOSE WAGONS . . . AERIALS 65′ to 144′ . . . COMBINATION LADDER TRUCKS

New Play Slide Offers Kiddy Challenge

Youngsters in Trenton, Mich., have a challenging task ahead of them to "earn" the fun of sliding on new equipment in the city's parks. The new units require the kiddies to climb a safe, but somewhat difficult, incline before sliding to the bottom. The slide is tapered so that the very young as well as older children can use it.

The equipment, known as Earn-A-Slide, is a product of the Miracle Playground Co., Grinnel, Iowa.

Last summer Trenton's Department of Parks and Recreation located one in a tot-lot and another in a 4½-acre community park. Ronald J. Heaviland, Director, reports that his department has studied the use to which the slides were put. It was discovered that both slides were extremely popular with the children but that the slide in the tot-lot has received much more use than the one in the 4½-acre park.

Mr. Heaviland has also observed that this type of equipment is most beneficial to the children and helpful in their physical growth.

Before Trenton youngsters can enjoy a slide from the peak of this inclined trapezoidal unit, they have to "earn" their way to the top by a challenging, but safe climb.

Public Relations Sells Park Plan

Color-slide presentations and distribution of brochures to schools, civic organizations and clerks handling voting registrations in Aurora, Colo., have once again demonstrated the power of an informed public.

Aurora, a residential community abutting the eastern city limits of Denver, has far out-stripped the rapid growth of that region. Among the many problems generated by such growth—schools, utilities, hospital facilities—was the need for parks and playgrounds to serve young, growing families.

Recently, the City Planning Department prepared a Parks Master Plan as one section of an advance planning program initiated in 1957 under combined city and federal funds.

A survey of land dedicated to park and recreational uses disclosed that only 85 acres had been allocated, supplemented by 60 acres provided by schools for playground and playfield use. On the basis of accepted requirements of ten acres of recreational land for each 1,000 residents, Aurora's 38,500 citizens lacked some 200 acres at the time of the survey and would be critically short of such land if a 1980 projected population of 100,000 persons develops as expected.

The master plan survey also revealed that, if park land had been purchased years ago, expenditures would have been considerably lower than current appraisals dictate. The Parks Master Plan advocated acquisition of future recreational and park development land. Also included were expenditures for improvement of existing parks.

Bond Issue

A $400,000 parks bond issue was proposed. Of this amount, $112,500 would be used for current improvements and $287,500 would be used to buy land for the proposed park areas. At the time of the proposals only a month remained before a bond election. It was a very short time in which to sell the program to Aurora taxpayers.

During that month, the color-slide presentations showing what had been done in the past and what was needed in the future were shown to local groups. The brochure explaining the bond program and emphasizing park and recreational needs was published and 5,000 copies were distributed through the schools, various civic organizations and by voting-registration clerks.

Aurora voters approved the expansion and improvement program, in spite of the fact that a $1,900,000 school bond issue had passed only a few months before and that a $2,000,000 hospital proposal shared the ballot with the parks bond proposal.

Items that are now possible in the city—in addition to preserving much needed land for park use—are a second swimming pool, a community building and a golf course.

Better Ways of Measuring Bathing Beach Pollution

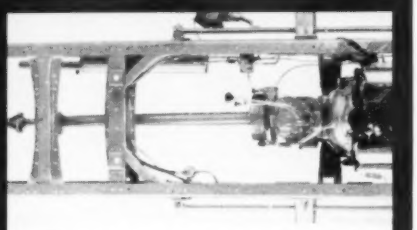
When you measure the pollution of bathing beaches, you use the wrong index if you merely determine incidence of the coliform group, according to Dr. Max Levine, Hawaii Department of Health, at the recent international conference on waste disposal in a marine environment held at the University of California at Berkeley.

Dr. Levine pointed out that the presence of coliform bacteria may indicate no more than soil washings. No one yet has been able to connect the coliform index with the incidence of intestinal disorders or other diseases among bathers. Moreover, failure to differentiate the various members of the coliform group has mitigated against adequate appreciation of their possible different sanitary significances.

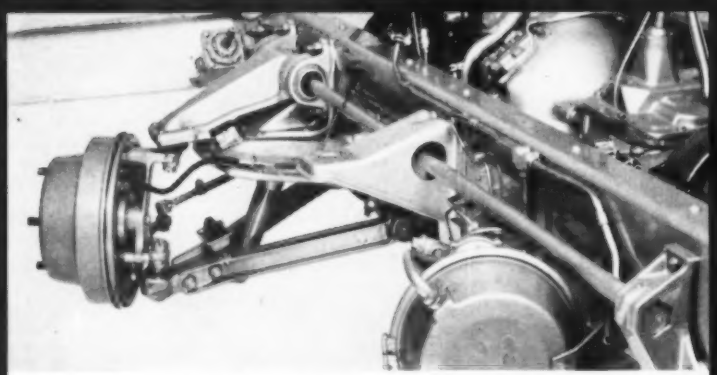
Fecal streptococci or especially typical fecal *E. coli* provide a better index, he feels, particularly since methods for determination of the *E. coli* index within 24 hours are now available.

Chevy's major components for 1960 last up to four times longer than ordinary truck parts—exhaustive testing has proved it. Likewise, the totally new cabs have proved 67% more resistant to twisting; and new frames for many models are as much as 4.8 times stronger in torsional rigidity. These are typical 1960 Chevrolet truck facts and figures—and they point up a new kind of tough truck build that helps you hang on to your dollars!

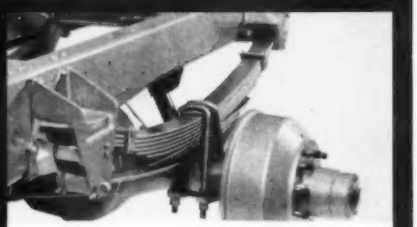
Chevy's precision-balanced wheels run smoother. Balancing weight shows that all front wheels are balanced in assembly—an advantage no other truck offers. It's assurance of easy handling; that tires will last longer without shimmy and shake from wheel imbalance.



Chevy's new frames are built with new brawn. Box-section rail design is stronger than ever; rail section modulus has been increased as much as 57%. Massive "K" or "X" brace crossmembers add to truck stamina; help keep you going years longer at least expense.



Chevy's new torsion-bar independent front suspension saves maintenance, increases work output. Independently suspended front wheels step right over bumps; tough torsion bar springs soak up shocks. As much as 58% of all objectionable road shock is absorbed before it reaches truck body, sheet metal or driver!



Chevy's easier riding rear springs help roll up profits. New variable-rate rear springs come in high capacities to handle huge payloads. Spring resistance adjusts automatically to cushion the load better.

CHEVROLET'S BIG NEW BUILD IS LIKE MONEY IN THE BANK FOR YOU!

Here are just a few of the *many* ways in which Chevrolet's totally new build for '60 will work to build a bigger bank account for you. They show that a '60 Chevy means *profit* through longer life, less maintenance, easier working, outsized cargoes and extra economy! You'll find, too, that 1960's savingest truck *power* is Chevrolet's: famous economy 6's and efficient short-stroke V8's for light-duty models . . . high-power, high-torque V8's and tough, dependable 6's for the bigger trucks. It'll profit you to see your Chevrolet dealer about Chevy's big new build, sometime soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

1960 CHEVROLET STURDI-BILT TRUCKS CHEVROLET

Waconia's new fire engine.

Waconia's New Pumping Engine

A 1,000-gpm rear wheel drive FWD pumping engine was recently purchased by the Waconia, Minn., fire department. It features a chromed radiator shell, a coupe-type cab, synchromesh transmission with fifth gear in overdrive, and an extra large, lighted, rear compartment.

Equipment includes the 1,000-gallon Waterous pump with electromatic controls; 500-gallon capacity top-fill booster tank; two preconnected 1½-inch rear discharges; suction hose and aluminum roof ladders.

Located in Carver County, the City of Waconia is 26 miles southwest of Minneapolis on the southern shore of beautiful Lake Waconia. Close by is the famed, twelve-mile-long Lake Minnetonka, headwaters of Minnehaha Creek and Minnehaha Falls, immortalized in Longfellow's "Hiawatha." The area is one of the oldest and most famous summer resorts of the Northwest.

Dial 999 For Emergencies

A simple emergency telephone number is now providing quick protection for the 412,250 residents of Greater Winnipeg, in Canada. Fifteen municipalities have joined in the metropolitan system which is claimed to be the first one of its type in North America.

Residents merely dial 999 to obtain emergency, fire, police or medical aid. The call is received by a central switchboard in the Winnipeg police building, then relayed to the correct municipality.

Vital to the new system are the ten carefully trained emergency operators, chosen for their linguistic abilities, who work a two-person, eight-hour shift. All operators are women, supervised by a dispatching officer of the central Winnipeg police force, located in the same room.

Tape machines that record every call and the time of each call coming in on 999 serve as a valuable means of checkback to untangle garbled messages.

Establishing the new system meant installing separate telephone lines to all district police and fire departments. Calls relayed to these stations come in over telephones colored a bright red.

At a rate of 8.28 cents per capita, the system will cost the municipalities a total of $34,100 annually. Equipment and installation cost was $14,900.

To make the system effective, street names throughout the area were given a thorough revision. In some cases identical names had been used ten or more times.

After six months, officials of satellite municipalities, who first feared the emergency system was a first step toward being swallowed by a metropolitan form of government, credit 999 with saving both time and confusion.

Operators at the Winnipeg emergency switchboard.

That's Lock Joint Concrete Pipe!

Whether it be the largest concrete pressure pipe in the world, or a small diameter drainage pipe;
. . . . pipe for the highest heads common to water works practice, or pipe for only nominal pressure or partial vacuum;
. . . . pipe to resist extremes of overburden, or pipe to meet the complexities of industrial or plant piping;
. . . . LOCK JOINT can provide all these, and more.

You will also find it a dependable, durable, maintenance-free pipe of sustained high carrying capacity which is backed by a company with over a half century's experience in the development and production of concrete pressure, sewer, culvert and subaqueous pipe.

LOCK JOINT PIPE CO.
East Orange, New Jersey

Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Kan. • Perryman, Md. • St. Paul, Minn. • Winter Park, Fla.

Pressure • Water • Sewer • **REINFORCED CONCRETE PIPE** • Culvert • Subaqueous

Metropolitan Planning and Zoning Research Unit

A metropolitan research unit has been established by the Fels Institute of Local and State Government at the University of Pennsylvania, Philadelphia. The unit is under the supervision of Dr. James G. Coke, Associate Professor of Political Science and Executive Director of the Study Commission of the Philadelphia Metropolitan Area.

In creating the new unit the Fels Institute also established a number of $3,000 and $4,000 pre-doctoral fellowships in an effort to give selected students an opportunity to delve more intensively into the problems of metropolitan area development. Four research fellows are now actively engaged in the unit's program.

Present emphasis of the unit is on the analysis of planning, zoning and sub-division control in the five-county metropolitan area. Other aspects of the growth and development of the Philadelphia area will be undertaken upon the completion of the current project in the early months of 1960. A study of inter-jurisdictional agreements, undertaken for the Study Commission over a year ago, has been completed.

Pakistanis Receive In-Service Municipal Training

On February 1st, two government officials from Pakistan, a a country near the birthplace of the human race and once the farthest eastern limit of the ancient Roman Empire, completed a two-month on-the-job training assignment in modern public administration methods with the City of Long Beach, Calif.

Mr. Mohammad Rahman, Deputy Secretary of the Pakistan Ministry of Commerce, and Mr. Mohammad Rahmani, Assistant Secretary of the Ministry of Railways and Communications, are members of a group of 20 Pakistanis who are in the U. S. under a program sponsored by the International Cooperation Administration of the State Department. The program provides a six-month executive-development curriculum for senior civil-service personnel of the Pakistan government.

Pakistan, which received its independence in 1947, hopes to streamline its public administration methods by means of the program.

Air Pollution Control Notes

Certificate of Award

Four cities have been awarded the 1959 Certicate of Award of the National Cleaner Air Week Committee of the Air Pollution Control Association. The cities, cited for distinguished service to the Committee's nationwide program of public information for advancing the knowledge and practice of air pollution control, are: Philadelphia, Pa., New York City, Columbia, S. C., and Cincinnati, Ohio. Certificates of Award were presented to officials of the cities.

AP Control Courses Available

Four air pollution control courses will be given in Cincinnati from April through June at the Robert A. Taft Sanitary Engineering Center of the United States Public Health Service. The courses are as follows: "Atmospheric and Source Sampling," April 4th through 15th; "Analysis of Atmospheric Inorganics," April 25th through 29th; "Analysis of Atmospheric Organics," May 2nd through 6th; "Community Air Pollution: A Special Course for Sanitary Engineer Reserve Officers," June 6th through 18th. Additional information may be obtained by writing to the Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

Steel Strike Implicates

The old saw about an ill wind proved to be true in at least two of the nation's major steel towns during the recent long strike. In Pittsburgh and Cleveland, air pollution was reduced significantly. Pittsburgh reported a 60% average drop in air contamination, while Cleveland officials said air pollution during the strike was at an "irreducible minimum."

Claims Toledo Air Is Cleaner

Jack A. Canning, Toledo supervisor of air pollution, reported recently that the air over Toledo is cleaner than that of other cities in Ohio, notably Cleveland and Columbus.

Toledo participates in the National Air Sampling Network conducted by the U. S. Department of Health out of Cincinnati, Ohio. The latest findings of the network show a measure of suspended particulate matter on an average basis with Toledo having a count of 124 micrograms per cubic meter; Cleveland 185, Columbus 186, Detroit 148, and Youngstown 203.

Mr. Canning claimed that the air is becoming cleaner throughout the country because the use of coal as a fuel is declining, while the use of gas and oil is increasing.

Lancaster Test Progresses

The Pennsylvania State Health Department has completed phase one of a two-part study of the air-pollution problem in Lancaster. The first phase was conducted during the heating season. The second will take place in the spring, following the end of the heating season. Findings and recommendations will be submitted to the city after the tests are completed.

Pamphlet Series

The Bay Area (California) Air Pollution Control District is publishing a series of pamphlets on its work and on the organization of the district. One of the pamphlets is entitled "Man-Made Haze" and is devoted to a description of the type of pollution in the San Francisco Bay Area. The other, "Technical Library on Air Pollution," describes the ease with which more than 7,000 pieces of literature may be consulted in the district's offices. Copies of these pamphlets and other Bay Area material may be obtained by writing to the Bay Area Air Pollution Control District, 1480 Mission St., San Francisco 3, Calif.

—Prepared by Kenneth Kowald

CITY OF SUNNYVALE, CALIFORNIA—Compacting hot mixed asphalt is one of the many jobs performed by the city's Huber-Warco 3-5 ton tandem roller. It has over 3,000 hours on it and only $48.00 was spent on repairs last year. The roller works year 'round on street and park maintenance.

HUBER W WARCO

HUBER-WARCO *tandem rollers*

3-5 ton 4-6 ton retractable 5-8 ton 8-10 ton 8-12 ton 10-14 ton

DRIVE FEATURES — Water-cooled torque converter cushions against shock. Tailshaft governor maintains desired speed regardless of grade for easy, accurate control. Two-speed transmission* prevents loss of efficiency in tailshaft governor or hydraulic steering at all rolling speeds.

KING OF KINGPINS — Complete freedom from kingpin and swivel pin looseness. Tapered roller bearings permit "like-new" adjustment. No road scuff in reversing. Kingpin and housing easily removable.

CONTROL FEATURES — Variable hydraulic control adjusts to steering "feel" best for operator. Dual controls. Parking brake system completely independent.

PERFORMANCE PLUS — Work within less than 2 inches of buildings. Unsurpassed visibility. Final drive mounted in the frame, not on it, for longer shaft, gear and bearing life.

*Except for 3-5 ton and 4-6 ton models.

A trusted product name backed by respected distributor names from coast to coast

MOTOR GRADERS

Standard transmission models from 83 to 160 H.P. Torque converter and power shift transmission models from 102 to 195 H.P.

TANDEM ROLLERS

3-5 Ton • 4-6 Ton Retractable • 5-8 Ton • 8-10 Ton • 8-12 Ton • 10-14 Ton

3-WHEEL ROLLERS

10-Ton • 12-Ton • 14-Ton Standard Weight 10-12 Ton • 12-14 Ton Variable Weight

MAINTAINER

M-52 — 45½ H.P. Attachments are Lift-Loader, Broom, Bulldozer, Patch Roller, Scarifier, Snow Plow, Berm Leveler

HUBER-WARCO COMPANY Marion, Ohio, U.S.A.

The Public Judges Litter Receptacles

Litter receptacles were the aspirants in the latest Los Angeles, Calif., contest. The "Popularity Contest," as it was called, served to launch an anti-litter campaign, to provide several months of testing for eight different kinds of receptacles and to stimulate public participation—and cooperation—in the campaign itself.

The contest, designed by Bureau of Street Maintenance Director Ben R. Paris and directed by Arch L. Field, vice president of the Los Angeles Board of Public Works, started with placement of 15 of each type of receptacle at selected locations. Newspaper photographs, television shots and radio descriptions urged public comment to determine which of the units was the most practical, economical and attractive.

The Bureau's staff, with a group of Hollywood motion picture art directors, industrial designers and advertising executives designed one exhibit and entered it in the contest. This one, a turquoise-colored metal basket of tapered steel rods, with a lighter-colored concrete base to discourage theft, lost out against the winner in spite of the combined efforts of the experts.

The winner, manufactured by Hodge Steel Metal Products, Inc., Los Angeles, is an open, meshed-steel basket, silver painted and durable. Mr. Field, when he announced the winner, complimented the public on their choice. The selected basket, he said, was not only the most popular, it proved to be the most efficient and economical, as well as the most acceptable by Bureau standards.

It is 18 inches in diameter at the base, 22 inches at the top and 29 inches tall, with a capacity of four cubic feet. It is easily recognized by the public and is light enough to be picked up without difficulty by street maintenance employees.

The proper use of the city's new sidewalk receptacles is demonstrated by Arch L. Field, vice-president of the Los Angeles Board of Public Works.

Director Paris said that the receptacles would be emptied once a day at normal intersections and twice daily or more often at busier locations.

Of the first batch of 250, purchased at about $15 each, 80 were set at downtown intersections and the others will be installed throughout the city. They will supplement the 950 (mainly push-lid) receptacles now in city use, but it is expected that Los Angeles eventually will have 10,000 of them combatting sidewalk litter.

Results of the contest were publicized by the erection of a 30-foot-high replica of the accepted basket, composed of ringed tiers of the baskets themselves. The display was maintained for a week after the contest ended.

Meet Joe Benito— A Man With a Record

Early-rising, cigar-chewing Joe Benito, chief street sweeper for Santa Cruz, Calif., has logged more than 200,000 miles of sweeping during his 13 years at the wheel of the city's motor sweepers. This is an impressive record in any league, but even more praiseworthy is the fact that in all those miles Joe has not so much as a paint scrape to mar the perfect safety record of his service.

The 52-year-old sweeper pilot, with his coveralls, crash hat and ever-present cigar, is one of the most familiar sights along the city's streets. His day starts at 3 a.m. and ends at noon, so a large portion of his sweeping activities is spent navigating through heavy fogs that characterize the area during predawn hours.

SERVE MORE DRIVERS . . .
HELP YOUR MERCHANTS . . .
INCREASE YOUR REVENUES . . .

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MANUAL PARKING METERS

MI-COs give everybody a chance, bring customers closer to business, add to your revenue. In twenty years these sturdy meters have proved their worth in over 500 cities, paying for themselves quickly and continuing to produce constant, substantial revenues. MI-CO manuals contain but six moving parts, scientifically engineered for longer, profitable, trouble-free service in any climate. Adjustable to any number of hours; and 1¢ to 25¢, with one coin slot. Twin Automatics available, too; also exclusive tamperproof coin collection system. Get our engineers' complete MI-CO story before you place or replace meters.

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(The Michaels Art Bronze Co., Inc., General Offices and Plant, Erlanger, Kentucky)
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Display Cases • Reversible Windows • Tablets • Memorials • Signs

Wood-to-Cast-Iron Change Completed

The 7½-mile-long system of wooden water mains in Mt. Rainier, Md., is now a thing of the past. The wooden mains, built prior to 1919, started giving trouble when pressures were increased to satisfy the rising demands.

The Washington Suburban Sanitary Commission took over the Mt. Rainier sewerage and water system in 1920. At that time a well, located on undeveloped land, fed the wooden mains. The system ultimately was tied in with those of other communities and new water sources were developed. By 1945 Chief Engineer Harry B. Shaw (then Deputy Chief Engineer) reported that higher pressures together with the deterioration of the wooden mains made a replacement program imperative. However, it was not until 1948 that actual work got underway. Ten years later the last wooden main was replaced making WSSC's system completely cast iron.

The Mt. Rainier system originally consisted of wood-stave pipe wrapped with steel wire and covered with a protective coating made up of "a mixture of asphalt, sawdust and wood shavings." Trouble developed where the coating wore off and the wire wrapping corroded.

The original estimate for replacing the 7½ miles of wooden mains, made in 1945, amounted to $252,551. However, with constantly rising prices over the years actual cash outlay exceeded that figure. The work was done by WSSC crews.

James B. Bland, veteran member of WSSC, holds a section of a wooden main once part of the Mt. Rainier system. A sample of modern cast-iron main is on his right.

It will be years before this mile-long, double-decked highway and railroad bridge has to be repainted. Every coat of the maintenance paint now being applied contains *M50* pigment.

Maine triple protects big Kennebec bridge with 3-deep, *M50*®"Defense-in-Depth" paint system

Did you know that you can now buy metal protective paints with anti-corrosion pigment in *all three coats* . . . primer, intermediate *and* finish?

Did you know that these "Defense-in-Depth" paints are so durable that primers alone . . . with no intermediate or finish coats to protect them . . . have endured *years of exposure?*

A relatively new pigment, *M50*® *basic lead silico chromate,* permitted development of these outstanding new-type metal protective paints.

And how they've caught on!

In October, 1956, Maine painted a small highway bridge in Minot's Corner with *M50* "Defense-in-Depth" paints. Small photos show you how that paint job looked in August, 1959.

Now Maine is giving its mile-long double-decked, Kennebec Bridge in Bath the same *M50* pigment 3-deep protection. Old surface is brush blasted then given an *M50* spot prime and an *M50* intermediate coat where needed. Final step is the application of 2600 gallons of an *M50* green finish coat.

As Maine goes...

. . . so goes the nation. State after state is completing its early tests of *M50* "Defense-in-Depth" paints and has big *M50* bridge maintenance painting jobs under contract or advertised for bids . . . Georgia, Missouri, New York, South Carolina. And many more to follow suit.

Your regular paint suppliers can make *M50* "Defense-in-Depth" paints. Ask them. For technical details on *M50* pigment itself in metal protective paints, write National Lead Company.

Above decks . . .

Below decks . . . First Maine bridge to be painted with *M50* "Defense-in-Depth" paints remains free of film defects. Bridge, at Minot's Corner, was painted 34 months before pictures were taken.

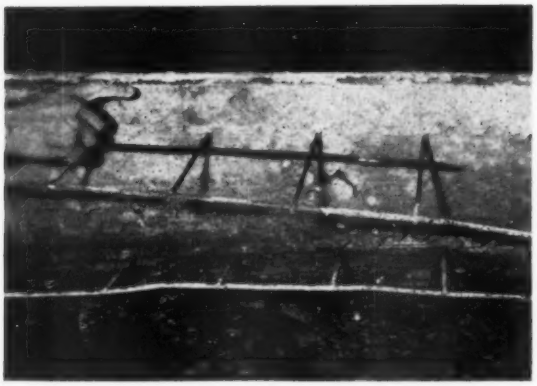
M50 *an* **oncor** TRADEMARK

pigment development of

National Lead Company

General Offices: 111 Broadway, New York 6, N.Y.

A Tough Floor for a Rough Job



The top ¾-inch of the storage pit in Cleveland's new incinerator (left) is covered with Anvil-Top to protect it from the pounding and scraping of four-ton steel crane buckets. The cross section of the pit floor (above) shows the steel mesh reinforcing and the ¾-inch-thick iron-clad pit bottom, expected to provide protection equivalent to one-inch-thick steel plate.

In constructing its new $2¼-million incinerator plant, Cleveland, Ohio, gave special attention to an item one might consider relatively unimportant—the refuse storage-pit bottom. Through the use of a Master Builders' all iron-aggregate concrete topping, city officials responsible for the project expect to solve the problems resulting from the intense impact and abrasion to which the pit bottom and sides are subjected. Ease of cleaning, better sanitation and fewer shutdowns for repairs will be results well worth the effort.

Past experience has shown that reinforced concrete and even solid rock does not stand up. Steel sheeting buckles with time, allowing debris to collect behind it, creating a tough cleaning problem. The topping, known as Anvil-Top, placed to a thickness of ¾-inch, offers protection equivalent to one-inch-thick steel plate (at a cost reduction of about 40%) and an impact and abrasion resistance up to six times greater than normal concrete.

The pit floor, 20 feet wide by 160 feet long, required 106 cubic yards of concrete and 51,500 pounds of Anvil-Top. Because of low temperatures in the deep pit, work on the floor was scheduled for mid-June. The job, divided into three sections, took three days to complete. First the two end sections were poured, then the center section.

An erection crane lowered five-yard loads of two-inch slump concrete to the pit bottom. Reinforcing consisted of two layers of 6x6 #4 gauge reinforcing steel mesh, one layer placed over the first two inches of concrete and the other walked into place after concrete was screeded to within ¾-inch below the final level.

After three hours of constant checking the concrete was ready for the Anvil-Top. Screed guides of 1x4's placed over the concrete enabled workers to follow the pitch of the floor from the sides to the center. The material was mixed in a six-cubic-foot mortar mixer, placed in wheel-barrows 400 pounds at a time and then lowered to the pit bottom by the erection crane.

Workmen roughly raked the material to ⅜-inch above final level, compacted it with grill tamps and then cut it to final level with magnesium scrapers. Kelley Hydrotrowels and mechanical floats were then used to further compact the material and give the floor its final finish.

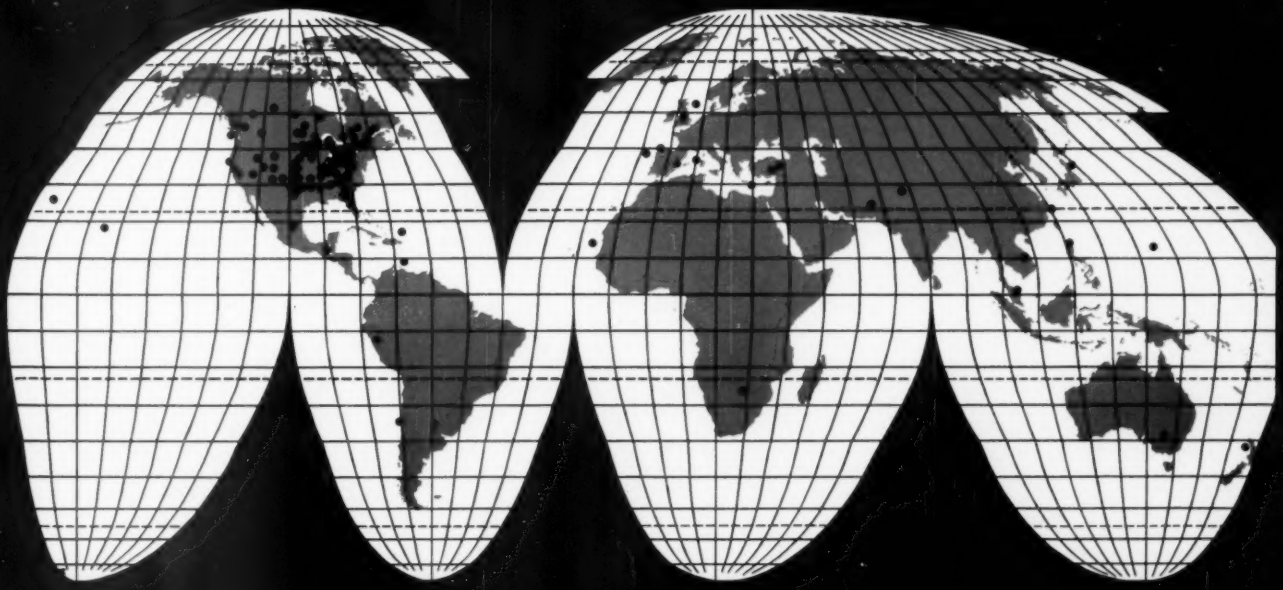
The morning following each day's pour, MasterKure, a membrane curing compound, was sprayed over the floor.

To protect the walls from being damaged by the 8,000-pound steel crane buckets, they were reinforced with 90-pound rails placed vertically two feet three inches on center around the entire perimeter of the pit, supplemented by #11 reinforcing bars.

George S. Voinovich was the architect, and Adache Associates, Inc., the engineers, both of Cleveland. John M. Heffelfinger, bridge engineer, was in direct charge of the work under J. R. Katz, Commissioner of Engineering and Construction for the City of Cleveland.

Correction

Table II, page 98, February issue (Calumet incinerator story) contained three errors. The errors were the use of "grams" for "grains" in the heading and a misplaced decimal point in the first two amounts in column two; the correct amounts are 0.0262 (instead of 0.262) and 0.045 (instead of 0.450).



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Any service is only as good as its availability when you need it.

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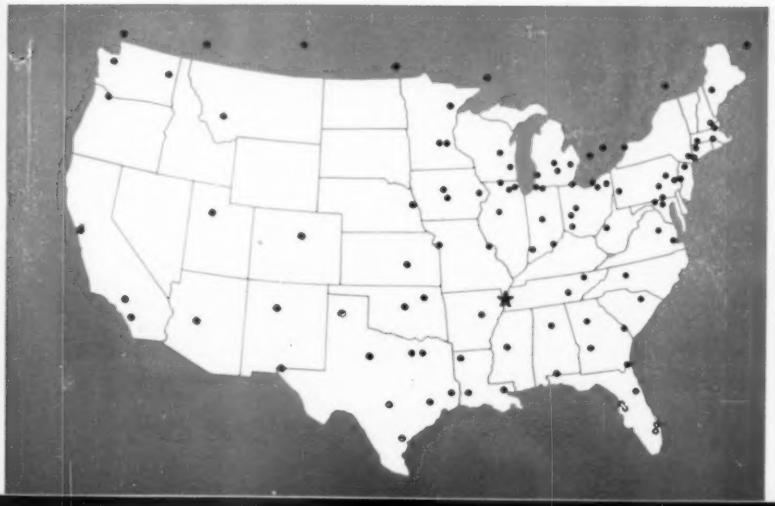
Layne complete water services include: initial surveys • explorations • recommendations • site selection • foundation and soil sampling • well drilling • well casing and screen • pump design, manufacture and installation • construction of water systems • maintenance and service • chemical treatment of water wells • water treatment • all backed by Layne Research.



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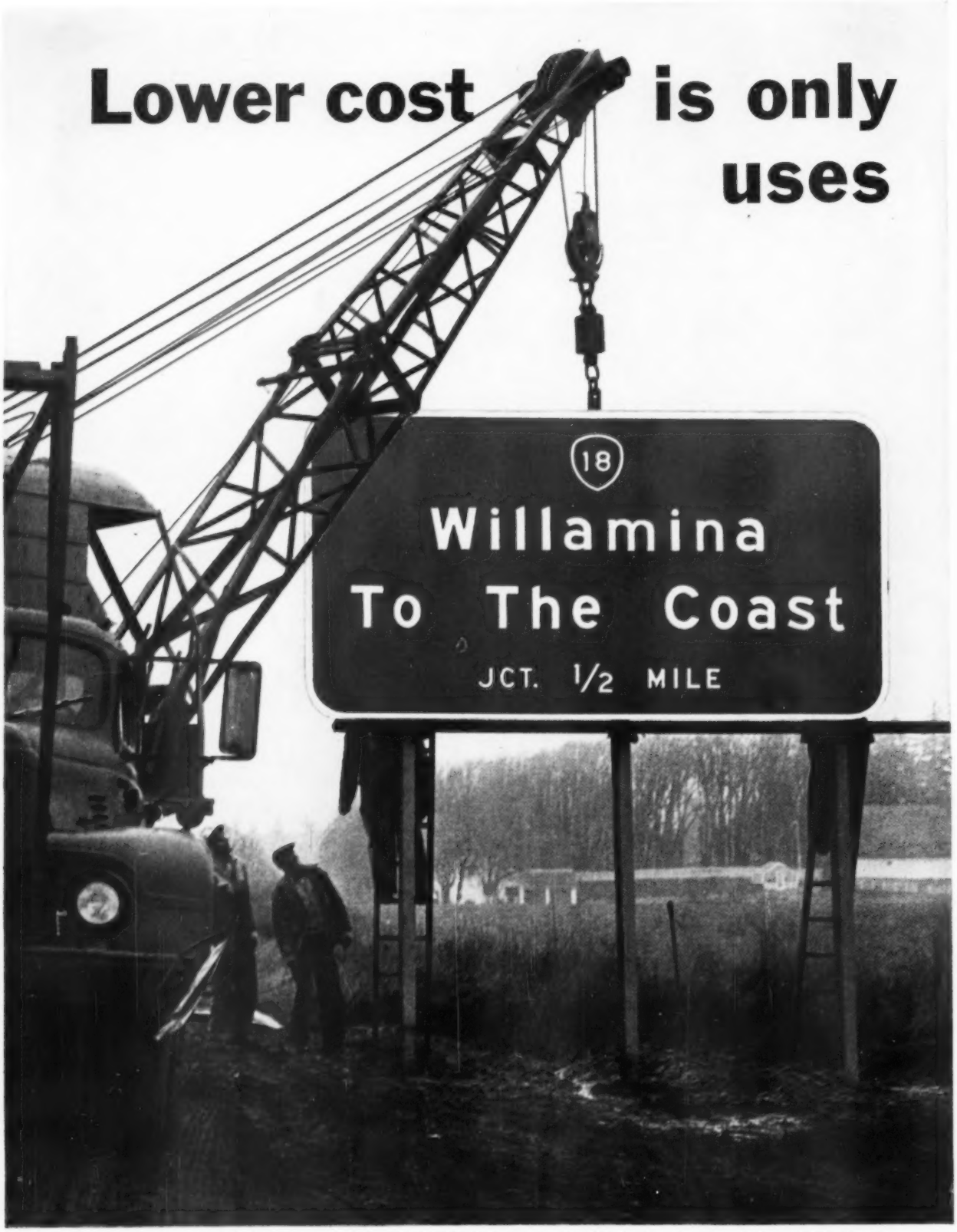
LAYNE & BOWLER, INC., MEMPHIS

GENERAL OFFICES AND FACTORY, MEMPHIS 8, TENN.

LAYNE ASSOCIATE COMPANIES THROUGHOUT THE WORLD

Sales Representatives in Major Cities



New colorfast green overlaid plywood with reflective button legend and border is used for green background direction signs.

one reason why Oregon signs of overlaid plywood

MODERN REFLECTORIZED OVERLAID PLYWOOD signs do a better job for the taxpayer as well as the motorist in Oregon.

State highway officials estimate the overall cost of an overlaid plywood sign installation averages 20 percent less than other acceptable materials. Savings are based on lower basic material costs, faster fabrication and finishing (neither sign face nor back is painted; reflective legend is applied direct)—plus elimination of the need for special back framing on signs up to 40 square feet in area.

But lower cost is only part of the story. Basically, Oregon uses overlaid plywood because it makes a strong, good-looking sign that stands up under prolonged weathering and deliberate or accidental abuse.

All told, the state maintains over 100,000 signs; 47,000 informational, 20,000 warning and 35,000 regulatory. Ninety percent are reflectorized, with reflective legend and border applied directly to the overlaid plywood surface. Key directional signs are illuminated. Black high density panels are used for warning and regulatory signs. New color-fast green acrylic overlaid plywood is used for green background direction signs to conform to national color coding on Interstate and other highways.

FOR MORE INFORMATION (detailed specifications, application data, etc.) write:

DOUGLAS FIR PLYWOOD ASSOCIATION

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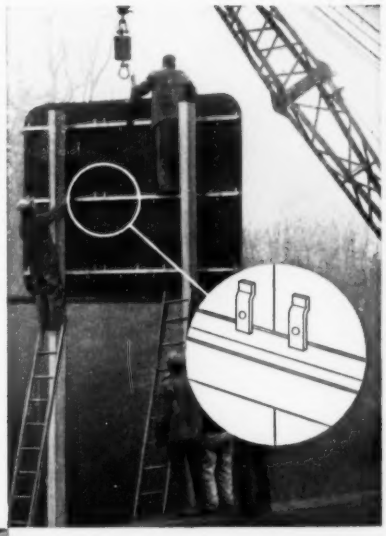
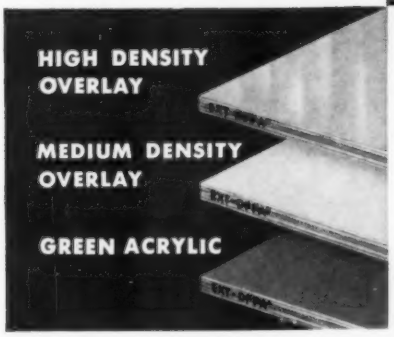
Always specify by DFPA grade-trademarks

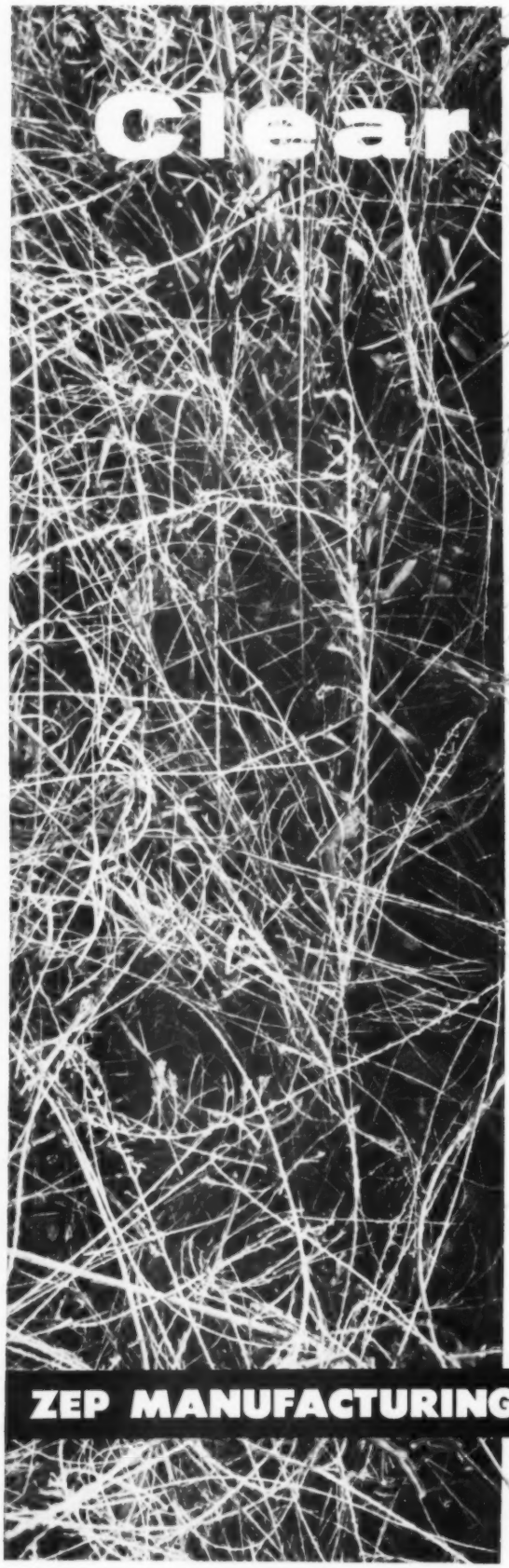
DFPA TESTED QUALITY



New panelized sign system used on recent Oregon installations employs standard aluminum girts and special clips. System is highly economical, permits flexibility in sign sizes and shapes. Developed by Douglas Fir Plywood Association, it meets all AASHO standards.



Medium density overlaid plywood is for plain painted signs; **high density** requires no paint protection and permits direct application of reflective sheeting. **New acrylic overlay** comes in green and white for signs with painted or reflectorized legend.



Clear the way WITH Zep R-59 WEED KILLER

Penetrating deep into the soil, killing buried seeds and rootings . . . stopping weed troubles before they start . . . keeping areas weed-free longer . . . Zep R-59 Weed Killer clears the way to rigid weed control around municipal buildings and other property.

Zep-R-59 is actually the most economical method of municipal weed control there is. Highly concentrated, it is easier to handle and store . . . so powerful that just a little goes a long way, (even diluted 40 times with water it is *still* strong enough to do a complete job) you need to buy it less often. In addition, Zep R-59 cuts labor and equipment costs in maintaining city property.

MANY cities have made Zep R-59 a regular part of their maintenance programs . . . putting it to such uses as clearing weeds from grounds around buildings, parking areas, vacant lots, driveways, rights-of-way, and road shoulders.

For a FREE demonstration of Zep R-59 and its place in your maintenance program, contact your nearest Zep Maintenance Expert, or write us direct, you'll have an immediate reply.

FIRST
in Maintenance and Sanitation

ZEP MANUFACTURING CORPORATION

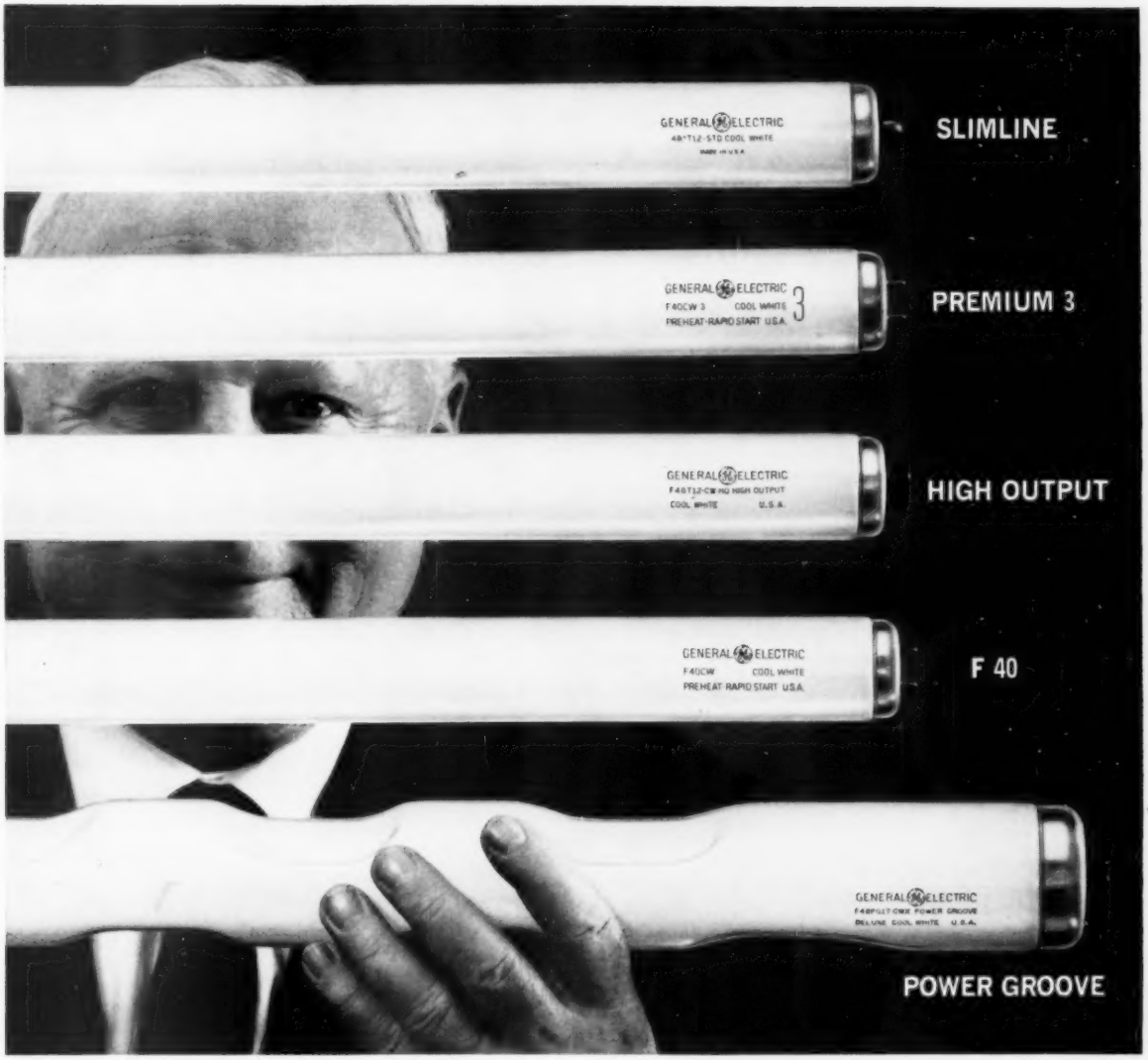
ATLANTA
1310 Seaboard Industrial Blvd.

CLEVELAND
13112 Broadway

KANSAS CITY
111 E. 10th Ave.

DALLAS
1103 Slocum St.

General Electric Fluorescent Lamps SAVE YOU MONEY



Take initial cost for example:

NEW G-E POWER GROOVE FLUORESCENTS CAN SAVE YOU $15 TO $85 PER LAMP!

General Electric's Power Groove* Lamp is the most powerful, most popular high intensity fluorescent you can buy. Because it *delivers* more light, you can have brighter plants, offices, stores, even outdoor lighting *while using fewer lamps and fixtures.*

Thus you can save, on initial cost, $15 to $85 per lamp over previous fluorescent types, depending on the installation. It's all because of the grooves in the tube which bend the arc stream and lengthen it to create extra light.

G-E Power Groove Lamps are a product of the same General Electric Lamp research that has improved *every* G-E Fluorescent you buy—whether it's the slimline, high output, or one of General Electric's two new 40-watt lamps.

WHICH G-E MONEY SAVER LAMP IS YOUR BEST BUY? There's one that will solve any lighting problem. And General Electric's published record of performance leadership is your assurance that, if you use G-E Lamps exclusively, your lighting system stays up-to-date automatically. For more information call your G-E Lamp distributor or write: General Electric Co., Large Lamp Dept. C-010, Nela Park, Cleveland 12, Ohio.

*General Electric trademark for its non-circular cross section fluorescent lamp

Progress Is Our Most Important Product

GENERAL ELECTRIC

General Electric . . . where bright ideas become better lamps

Safeguard Public Health and Public Funds with the one pipe that has all the features you can trust!

Sewer line failure not only endangers public health, but costs staggering sums in replacement time and materials. That's why Baxley, Georgia, insisted on Vitrified Clay Pipe for its sewer expansion project. Unlike many substitute materials, Clay Pipe does not rust, rot, corrode, disintegrate or deform . . . is completely resistant to the deteriorating action of *all* sewerage gases and acids. Available with joints that meet every requirement.

It is the *one pipe* with all the advantages you want . . . *all* the features you can trust!

PUBLIC OFFICIALS: J. M. Dunn, Mayor
CONSULTING ENGINEERS: Wiedeman & Singleton, Atlanta; T. L. Turner, Resident Engineer
CONTRACTORS: C & L Engineering Co., Augusta

WRITE TODAY for assistance in fitting Clay Pipe into your sewer project . . . and be sure of the lowest cost with the best performance.

Vitrified **CLAY PIPE** *Never Wears Out*

NATIONAL CLAY PIPE MANUFACTURERS, INC. 1820 N Street, N. W., Washington 6, D. C.
311 High Long Bldg., 5 E. Long St., Columbus 15, Ohio • 445 Ninth St., San Francisco 3, California • Box 172, Barrington, Illinois • 1401 Peachtree St., N.E., Atlanta 9, Georgia

MUNICIPALITIES

STOP WEEDS

with safe, effective

SIMAZINE *or* ATRAZINE

pre-emergence *pre- or post-emergence*

HERBICIDES

Economical, long residual Geigy herbicides save time and money—do the job right the first time. One application stops weeds before they start—gives you season long control.

Safe to humans and animals, non-irritating to skin, non-flammable, non-corrosive to equipment. Safe to use on valuable land. Available through leading distributors.

FREE BROCHURE: *New full color booklet contains complete directions, diagrams, applications and other useful data for both Simazine and Atrazine.*

Geigy *ORIGINATORS OF DDT INSECTICIDES*

MAIL COUPON TODAY

GEIGY AGRICULTURAL CHEMICALS,
Division of Geigy Chemical Corporation
Saw Mill River Road, Ardsley, N.Y., Dept. AC-3

Send free weed control brochure to:

*Name*_____

*Company*_____ *Position*_____

*Address*_____

*City*_____ *State*_____

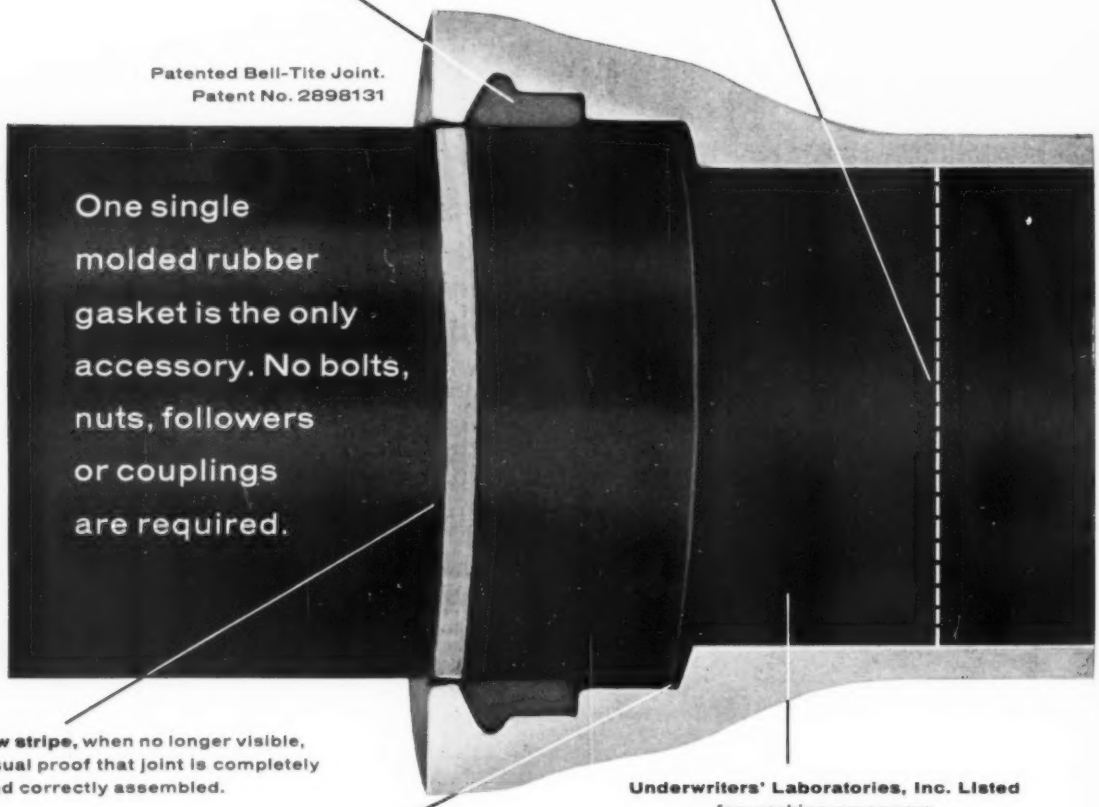
CLOW

Quick, Bottle-Tight Seal

Large, thick section gasket of long-life high durometer rubber forms pressure-tight seal.

Bell-Tite Joint Pipe available in diameters from 3" thru 24" in 18 foot lengths.

Patented Bell-Tite Joint. Patent No. 2898131



This yellow stripe, when no longer visible, provides visual proof that joint is completely and correctly assembled.

Underwriters' Laboratories, Inc. Listed for working pressures up to 350 psi.

Ample deflection to meet casual curves or grades is provided by space in socket of the bell.

CLOW CAST IRON PIPE

Cast Iron Pipe Plants at

BENSENVILLE, ILLINOIS • BIRMINGHAM, ALABAMA • COSHOCTON, OHIO

CAST IRON

PIPE

You can install

CLOW BELL-TITE® JOINT PIPE

as fast as you can dig a shallow trench

Pictures show CLOW 20" Bell-Tite Joint Cast Iron Pipe being installed to provide water for a midwestern industrial development. CLOW Bell-Tite Joint Cast Iron Pipe was selected because of its proved long life and the ease and speed of installation. Hulett Corporation, contractors.

LOWER
pipe into trench

SWING
into open bell

SEAL for
pressure-tight
joint

JAMES B. CLOW & SONS, INC.
201-299 North Talman Avenue, Chicago 80, Illinois

Subsidiaries:

Eddy Valve Company
Waterford, N.Y.

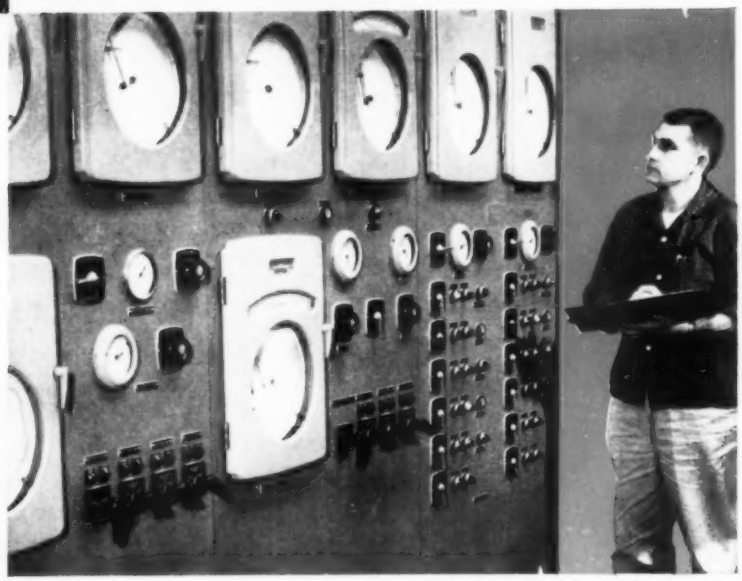
Iowa Valve Company
Oskaloosa, Iowa

POSITIVE CONTROL OF *MATERIALS IN MOTION* B·I·F METERS FEEDERS CONTROLS

B-I-F MAKES FILTER CONTROL AUTOMATIC . . . SIMPLE . . . ECONOMICAL!

B·I·F Builders-Providence

Auto-Central® Filter Control Systems Bring Push-Button Economies to Cost-Conscious Communities!



PROVEN DEPENDABILITY IN PUSH-BUTTON FILTER PLANTS

Installations at:

Rockville, Maryland
Alexandria, Virginia
Lexington, Kentucky
U. S. Steel, Fairless, Pa.
Philadelphia, Pa. (Queen Lane)
Marshall, Texas
Greenwich, Conn.
Greensburg, Pa.
Washington, Pa.
E. St. Louis, Ill.
Tonawanda, N. Y.
Ft. Lauderdale, Fla.
Huntington, W. Va.
Ardmore, Okla.
Port Arthur, Texas
Joplin, Mo.

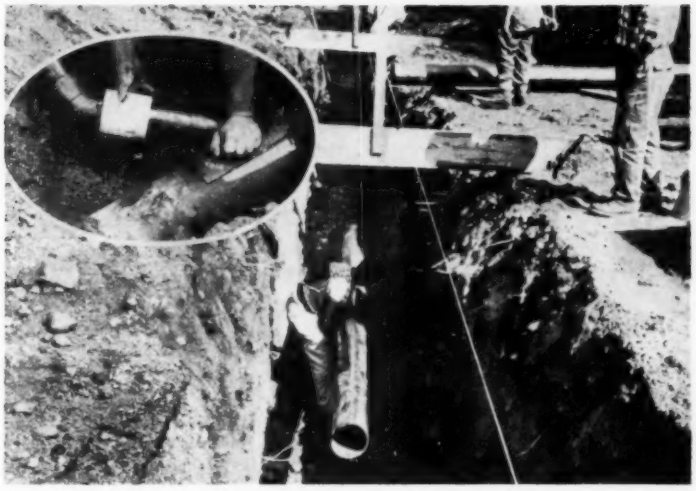
Put your filter plant under push-button control . . . save time, money and increase reliability. One operator, pushing one button, starts the automatic sequencing of all valves in the filter backwash cycle . . . starts a high speed recorder which eliminates need for log entries and computations.
Result: reduced operating time, elimination of human error, manpower released for more important duties.

System also permits economical arrangement of physical plant, lowers initial cost . . . automatically assures precise control of backwash cycle, provides reliability never possible with manual systems.

B·I·F Industries

BUILDERS-PROVIDENCE • PROPORTIONEERS • OMEGA
METERS • FEEDERS • CONTROLS / CONTINUOUS PROCESS ENGINEERING

For complete details, request
Bulletin 480.20-1. Write **B-I-F Industries, Inc., 358 Harris Avenue, Providence 1, R. I.**



A 15-foot length of plastic pipe is laid at a 2.5% slope. House-service connections (inset) were made by saddle-type plastic wyes with 4-inch branches solvent-welded to the main.

Plastic Sewer Main a U. S. First

Needham, Mass., has installed the first eight-inch plastic sewer main in the United States. The job, consisting of 300 feet of eight-inch main and 150 feet of four-inch plastic house-service connections, promises completely satisfactory results, according to the city's superintendent of sewers, E. A. Symonds.

No special problems were encountered, despite considerable ground water in the trench. Washed stone, ½- to ¾-inch in size, was used as bedding material, and the stone was built up on each side of the pipe to the spring line. Backfilling to one foot above the pipe was by hand; the remainder by machine.

Delivered on the job in 15-foot lengths, the joints were sealed with a solvent weld, which Mr. Symonds contends is the most foolproof joint available. Wye connections for house services also were solvent-welded, making a saddle connection.

Needham formerly specified asbestos-cement pipe for sewers because of its joint integrity and low installation cost, but concern over possible acid attack, especially in lines used for industrial wastes, led to specification of the plastic pipe. According to city officials, this type of main has the advantages of asbestos cement pipe and provides the chemical resistance of vitrified clay.

It is light, easily cut with a handsaw, can be drilled to make connections, and inspection holes cut in the main can be closed merely by cementing a piece of pipe over the hole.

Since the installation of the plastic sanitary line, Needham has used the eight-inch plastic pipe for a storm sewer with equal success, according to Symonds.

The plastic pipe used in the Needham projects was Evanite, manufactured by the Evanite Plastic Co., Carrollton, Ohio, a division of the Evans Pipe Co., Uhrichsville, Ohio.

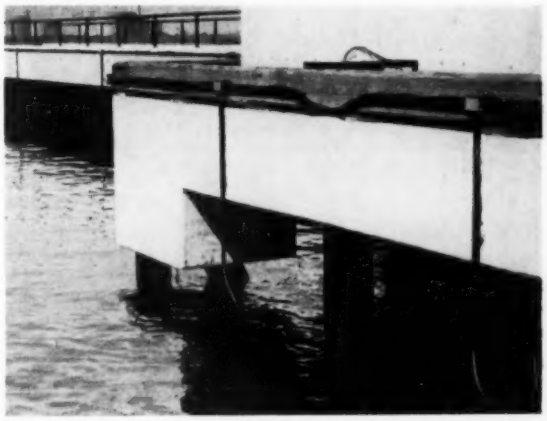
Corrosion Countermeasures

Corrosion has been a primary enemy in the sewage treatment plant operated by the Linden-Roselle (N. J.) Sewerage Authority. However, Superintendent Charles O. Saunders and his staff are finding ways to combat it.

In the ventilation building, the fan housing had to be replaced due to corrosion. The staff is currently experimenting with various types of protective coatings to minimize the problem.

At the main pumping station, the air supply line to the plant laboratory and machine shop failed due to electrolytic corrosion. A new air line of somewhat reduced diameter has been installed in the existing line to restore service.

However, at the dock, where the Authority berths sludge vessels, the steel "H" piles are resisting corrosion in fine shape. An examination by the Electro Rust Proofing Corporation, Belleville 9, N. J., showed that they are under complete cathodic protection.



These steel "H" piles are resisting corrosion.

FREE CATALOGS

These Catalogs Will Help You

By checking over these listings you can secure without charge important up-to-date information on many of the problems which may be troubling your city.

Write directly to the address given or use the Post Card on page 55.

Powerful Low-Mounted Highway Lighting Unit

483 A compact lighting system with a startlingly high brightness level is expected to have extensive use in low-mounted highway lighting, bridge and tunnel lighting, expressway turn-offs, building facade floodlighting and edge lighting for signs. It has just been introduced by SYLVANIA LIGHTING PRODUCTS, A DIVISION of SYLVANIA ELECTRIC PRODUCTS INC., DEPT. 63, 60 BOSTON ST., SALEM, MASS.

Safe, Strong Playground Equipment

484 If slides, swings, see-saws, carousels, climbers, etc., are your bailiwick, you'll probably want to obtain the complete playground planning and specification file offered by one of the nation's leading manufacturers of playground equipment, the J. E. BURKE CO., P. O. BOX 986, DEPT. 126, NEW BRUNSWICK, N. J.

Dog Licenses and Tags

485 Durable dog and cat licenses, rabies tags and other revenue-producing license markers in standard or special shapes, with or without links, in green, yellow, red or blue and a choice of metals can be furnished in the design and lettering you want. Write MEYER & WENTHE, INC., 39 S. JEFFERSON ST., CHICAGO 6, ILL., for details and catalog.

Got a Light Drilling Job?

486 Then put the Cobra to work. You'll find this 53-pound portable unit drills in any position up to 45°, and its efficient one-cylinder 2-stroke engine is able to drill 50-60 feet of hole on a single 2-quart tank-load of fuel. For descriptive literature and technical information, write ATLAS COPCO, DEPT. AC-7, 545 FIFTH AVE., NEW YORK 17, N. Y.

Dustless Street Cleaning

487 A street cleaner with a powerful, heavy-duty vacuum unit, a vapor-spray system and large-capacity truck body has been introduced to make street cleaning operations fast, low-cost, dustless and thorough. It is illustrated and described in *Form* No. A-437-A, available from BAUGHMAN MFG. CO., JERSEYVILLE, ILL.

Rotary Power Mowers

488 These rotaries are built to stand up under the most rugged cutting conditions, tackle the roughest terrain. They are equipped with bicycle-type wheels that glide smoothly over high grass and won't bog down in loose turf. Construction is sturdy, design simple, operation trouble-free. The 1960 Big Wheel Master Mower catalog will give you full facts. Write YAZOO SALES CO., INC., 3607 LIVINGSTON RD., JACKSON, MISS.

Sewage Pump Station and Lift Station Manual

489 A 100-page data manual on pump stations and pneumatic ejector lift stations gives job recommendations, complete specifications and drawings. It is offered by SMITH & LOVELESS, INC., DEPT. 10, P. O. BOX 8884, KANSAS CITY 15, KANS., makers of the "Oxigest" factory-built sewage treatment plant and a complete line of lift stations with capacities from 20 to 4800 gpm.

Stop Weeds Before They Start

490 A new weed control brochure contains complete directions, diagrams, applications and other useful data for Simazine (pre-emergence) and Atrazine (pre- or post-emergence) long residual herbicides. Write GEIGY AGRICULTURAL CHEMICALS, DIV. OF GEIGY CHEMICAL CORP., SAW MILL RIVER RD., DEPT. AC-2, ARDSLEY, N. Y.

Why Salt-Treat Gravel Roads?

491 Because rock salt used effectively binds aggregate and other materials tightly together and helps reduce damage to wearing course. A simple, practical 7-step method of economically salt-treating gravel roads is described in "Better Roads." For a copy, write INTERNATIONAL SALT CO., INC., DEPT. AC-260, SCRANTON 2, PA.

Measures Water, Sewage Magnetically

492 The Magnetic Flow Meters described in *Bulletin* 20-14 have no flow restrictions, no taps to get plugged or frozen, no seals or purges, no moving parts. They measure water, sewage, sludge and other treatment plant flows to an accuracy of ± 1%. For full facts and help with your municipal measurement problems, write THE FOXBORO CO., 953 NEPONSIT AVE., FOXBORO, MASS.

New Traffic Aids

493 Current literature from ECONOLITE CORP., 8900 BELLANCA AVE., LOS ANGELES 45, CALIF., gives full facts on three significant traffic aids: a graphic traffic counter that provides clear, accurate, continuous graphic records of traffic volume; an incandescent pedestrian signal of advanced mechanical design and legibility; a die-cast neon pedestrian signal with aluminum housing.

An Easy Way to Boost Water Pressure

494 If outlying areas of a municipal water system are suffering from periodic pressure drops, a hydropneumatic booster system should provide the antidote. This compact arrangement can be placed in small unobtrusive buildings that will harmonize with the local area and cause no residential complaints. For a full text on all types of hydropneumatic systems, write PEERLESS PUMP, HYDRODYNAMICS DIVISION, FOOD MACHINERY & CHEMICAL CORP., 301 W. AVENUE 26, LOS ANGELES 31, CALIF.

Speeds Water Meter Cleaning

495 Safely — without acids, solvents, brushes, scrapers—and in less than 5 minutes per meter—a new cleaning method removes dirt, discoloration, paint and scale from the inside and outside of water meters. The new technique is called Liquid Honing. For complete story, write VAPOR BLAST MFG. CO., 3037 W. ATKINSON AVE., MILWAUKEE 9, WIS.

Basic Prime Mover for 1,001 Jobs

496 . . . is the way OTTAWA STEEL DIVISION OF YOUNG SPRING & WIRE CORP., OTTAWA, KANS. bills The Commando—a totally new "power package" that combines the speed and utility of a truck with the power train characteristics of a tractor and accommodates singly or in combination matched Uni-Tools—aerial tower, power crane, fork lift, backhoe, bulldozer blade, snow plow, sweeper.

Street Paving Problem?

497 Two brochures containing helpful information on heavy-duty, intermediate and low-cost types of asphalt construction for streets, airports and parking lots can be obtained from TEXACO INC., ASPHALT SALES, 135 E. 42nd ST., NEW YORK 17, N. Y.

New Transistor Pipe Detector

498 This pipe detector has licked the problem of heat limitation, and so is well suited for use in hot southern climates. It detects and traces pipe, cable and conduit and locates valve boxes, services, etc. For maximum power, its transmitter uses two transistors. Write COMPUTER MEASUREMENTS CO., DIV. 6, 12970 BRADLEY AVE., SYLMAR, CALIF.; ask for File AC-3.

Safer Bridge Flooring

499 A new metal bridge decking, successfully tested for 4 years, has been found to eliminate "weaving" normally experienced by cars as they roll over open mesh steel bridge flooring. For full facts on "CK" Decking, write IRVING SUBWAY GRATING CO., INC., 5030 27th ST., LONG ISLAND CITY 1, N. Y.

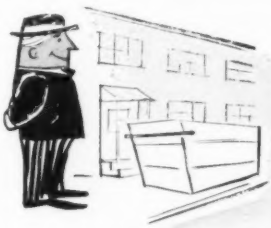
Backhoes, Trenchers, Maintainers, Tractor Shovels,

500 Better-performing, more versatile construction equipment, geared to do a superior job, lower costs, reduce manpower requirements and increase efficiency, is to be found in the 1960 complete-line catalog describing the industrial equipment made by MASSEY-FERGUSON INDUSTRIAL DIVISION, 1009 S. WEST ST., WICHITA 13, KANS.

(See page 50 for more Bulletins)

The Tale of the Commissioner's Crew...

In common with many sanitation commissioners, Commissioner Gregg was concerned over the problem of refuse collection, particularly the new city housing projects. He looked into containerization.



One of his first steps was to arrange for a Roto Pac demonstration. He was impressed. Roto Pac containerization is ideal for housing developments, institutions and commercial areas.

The reports from his crews were excellent: "Very simple to operate," "much less tiring for the operators," "fastest, easiest unit we've ever seen."

He could see for himself how much neater the Roto Pac containers were than the old accumulations of trash cans... rodent-proof, fire-proof and so much easier to keep neat too.

He found the Roto Pac to be the most efficient unit he'd ever seen. Because of its automatic continuous compaction, his crews lost no time waiting for batches to be compacted.

Of course, as Commissioner Gregg also learned, Roto Pac is the only collection truck on the market that can pick up manually dumped refuse on the same route as containers—all size containers—even the big 6 yard job.

More and More Cities find the ROTO PAC Container System means Lower Refuse Collection Costs

THE ROTO PAC CONTAINER Sturdy, neat, sanitary, and with the Roto Pac on-the-job disinfecting method, it stays that way. With six sizes to choose from, you can meet the requirements for any route. 1 to 6 yards.

THE ROTO PAC COLLECTION UNIT... the only unit on the market that provides *automatic continuous compaction.* The time it saves at each stop adds up to one extra full load per truck per day. That's efficiency! New or old Roto Pac units can be adapted at very modest cost for containerization.

For complete information on how the Roto Pac containerization system can cut your refuse collection costs, mail this coupon today.

Roto Pac Containerization
City Tank Corp.
Corona 68, N. Y.

Please send literature on Roto Pac container system and have your representative contact us for a demonstration.

NAME .....

TITLE .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

MONEY SAVING *catalogs*

Write directly to the address given or use the Post Card on page 55.

Got a Patching Problem?

501 Want a quick answer to it? Send for the new circular on ZOR-X, a new improved patching material that can be used in any weather, with area wet, dry or snow covered. It blends in with the old area—important where appearance is a factor—and is well suited for driveways, parking lots, etc. Write THE MONROE CO., INC., 1070S QUEBEC AVE., CLEVELAND 6, OHIO.

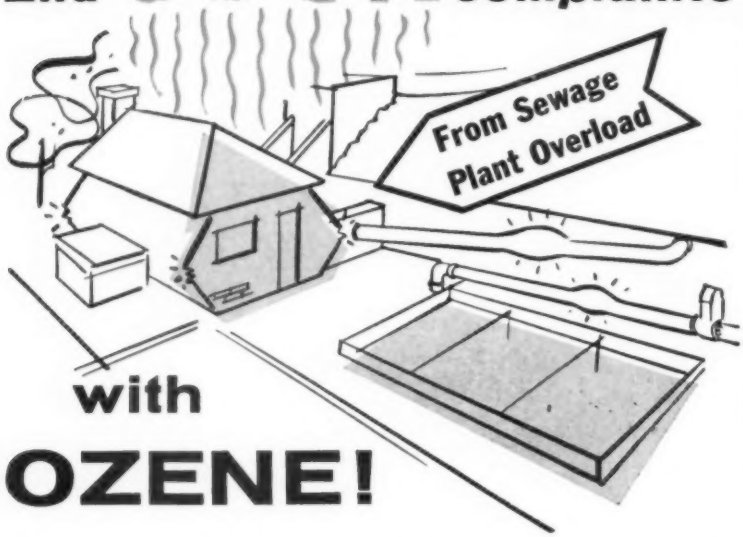
Safe, Serviceable Recreation Equipment

502 This equipment is engineered to meet exacting safety requirements. It includes playground equipment, indoor basketball backstops, and swimming-pool equipment. For descriptive literature, write RECREATION EQUIPMENT CORP., DEPT. AC-60, ANDERSON, IND.

Power for Municipal Waterfront Duties

503 A smooth, quiet-operating outboard with V-4, 89 cubic inch engine that develops 75 hp at 4500 rpm features electric starting, automatic choke, sea-going magneto ignition, rugged Jet-stream drive and two-way shock absorbers. It is called Starflite II. For descriptive literature, write EVINRUDE MOTORS, 4143 N. 27th ST., MILWAUKEE 16, WIS.

End ODOR complaints with OZENE!



Whether your odor complaint problem stems from overload or residential areas moving too close to your plant, you can solve it with Solvay® Ozene®.

Ozene ends odors quickly, easily, economically by (1) masking existing odors while (2) attacking the causes of odors—sulphide-forming bacteria, mold microorganisms. Ozene also cuts slime and grease deposits, eliminates filter flies.

Only 2-to-5 quarts of this concentrate stops odors in 450,000 gallons of sewage! Can be diluted up to 100-to-1 for odor controlling sprays.

Used in sewage, leather, rendering plants . . . land-fill waste disposal projects . . . dried milk, cheese, cannery and other food plants . . . industrial lagoons . . . new excess-capacity sewers . . . drainage ditches . . . incinerators . . . storm sewers . . . sewer breaks . . . sludge de-watering . . . fish market areas . . . refuse cans and trucks . . . kennels, etc.

Write for Ozene test samples. For specific information, please state your odor control problem.

Allied Chemical

SOLVAY PROCESS DIVISION
61 Broadway, New York 6, N. Y.

Branch Sales Offices: Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit Houston • New Orleans • New York • Philadelphia • Pittsburgh • St. Louis • Syracuse

Water Treatment Facilities

504 Two brochures are available from INFILCO, INC., TUCSON, ARIZ. *Bulletin* 1870-B discusses the "Accelapak," a complete "package-type" water treating plant for softening or clarification, and sterilization when required, available in capacities from 15 to 350 gpm and ideal for use by the small community. *Bulletin* 910 illustrates and describes an umbrella-type distribution nozzle for uniform distribution of backwash water.

Aid to Street Lighting Programmers

505 "A Bright City Is A Safe City" has just been published by KERRIGAN IRON WORKS CO., DEPT. A-3, NASHVILLE, TENN. Intended as a guide to planning and promoting street lighting programs, it contains charts and tables on traffic volume, light intensities, pole spacing and mounting heights and illustrates and describes re-lighting programs of specific communities.

Adjustable and Fixed-Blade High-Capacity Pumps

506 *Bulletin* 165 gives applications, performance characteristics, engineering, specifications and control for "axial flow" pumps that combine high speed with high efficiency and discharge capacity and permit lower cost pumping and electrical equipment. For a copy, write ALLIS-CHALMERS MFG. CO., YORK WORKS, YORK, PA.

Warning Lights and Sirens

507 The following valuable catalogs and bulletins are available from FEDERAL SIGN & SIGNAL CORP., 136TH & WESTERN AVE., BLUE ISLAND, ILL.: #300—sirens and warning lights for police, fire, ambulance; #100—sirens, horns, bells and signal systems; #17—CD warning systems; #200—siren fire alarm systems; #107—warning lights for street and highway maintenance and construction vehicles.

Parking Meters Advance

508 The world's first parking meter installation took place in July 1935 when 150 Park-O-Meters were installed in Oklahoma City. Now there are more than 600,000 Park-O-Meters in use in over 1,400 cities. Today's meter is a more versatile meter, designed to meet today's more varied curb-side and off-street parking requirements. For current literature, write MAGEE-HALE PARK-O-METER CO., 3909 WILLOW SPRINGS RD., OKLAHOMA CITY 2, OKLA.

Stop Corrosion

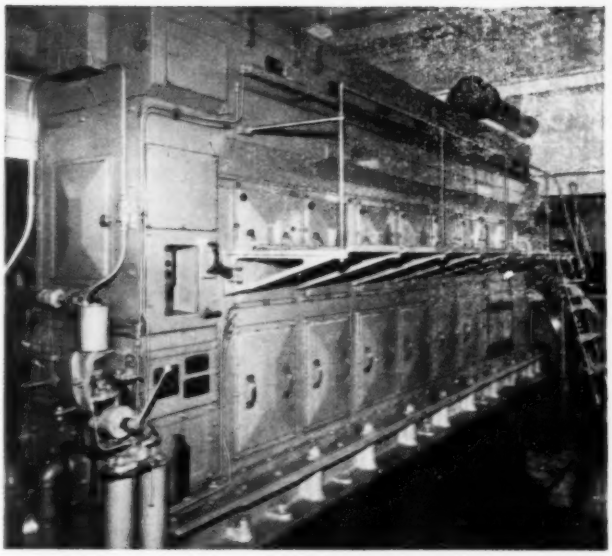
509 In the Bitumastic line there is a coating for every industrial corrosion problem. To get full facts about these coatings for corrosion prevention, and for on-the-job assistance to keep your corrosion costs down, write KOPPERS CO., INC., TAR PRODUCTS DIV., DEPT. 103C, PITTSBURGH 19, PA.

Low-Cost, All-Metal, All-Purpose Barricade

510 Literature just received from BARRICADE ENGINEERING, DIVISION OF ATLAS METAL PARTS CO., 2323 N. 31st ST., MILWAUKEE 16, WIS., describes a heavy 10-gauge steel barricade with square tubular steel legs of high tensile strength. It accommodates electric flashers, lanterns and pots, is easy to maintain, and has a diagonally striped black and yellow target area.

(See page 54 for more Bulletins)

over 15 KWH per gallon



** Superior 80-SX-8 Diesel at Princeton, Missouri, produces 15-25% more power per gallon fuel oil than comparable engine-generators!*

For the past three years, Consumers Public Service Company of Brookfield, Mo., has achieved remarkable fuel economy with a White Superior Model 80-SX-8 engine-generator package installed at Princeton. The Superior is rated 1440 HP at 360 RPM and drives a generator of 1000 KW capacity. This dependable combination produces over 15 KWH of electricity per gallon of fuel oil, which is 15-25% more power per gallon than comparable engine-generators commonly produce!

Superior's highly developed open chamber combustion system and a competitively-aimed series of exclusive design developments and refinements account for this thrifty performance. Moreover, the high KWH/gallon will remain consistent, because Superior is a rugged, heavy-duty, low-speed engine. It will not eventually "loosen up"—like lightweight, high-speed engines often do—causing a gradual drop in power output per gallon. Superior's economical operation goes far beyond fuel savings, too. Extreme design simplicity eliminates high mortality parts . . . means fewer replacement parts required, reducing maintenance and repair to a minimum.

Model 60 and 80 Stationary Diesels, six or eight cylinder, can be furnished as diesel, dual-fuel or gas engines. They are one segment of a complete line of Superior engines ranging from 190 to 2150 HP, or 150 to 1500 KW. White can custom-engineer a Superior to your exact requirements and apply its extensive experience with automatic, unattended and remote control operations to your problem!

Superior ENGINES ATLAS Imperial DIESEL ENGINES White DIESEL

White Diesel

WHITE DIESEL ENGINE DIVISION
THE WHITE MOTOR COMPANY
Plant and General Offices: Springfield, Ohio

LIKE A LOADER WITH EXTRA REACH?

The TL-20 has it! Means fast, even dumping into high-sided trucks—no wasting time leveling material to distribute it evenly.

That extra foot or two of reach that you get with a TL-20 tractor loader makes a big difference in your output. You clip valuable seconds from work cycles by dumping loads right into the center of high-body trucks. No time-consuming loading from both sides . . . no pitching . . . no wasting time dozing to distribute material evenly—and no banging up truck and loader.

Other exclusive advantages include: *Faster Shifting*—one lever controls both forward-reverse and all speeds. *Greater Stability*—easier loading, less spillage, more operator comfort. *Strong, Pin-Connected Axles* prevent rolling and shifting of axles under load. Your Allis-Chalmers dealer can show you other tractor loader advantages that bring extra production on excavating and loading work. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

TL-20—6 buckets, from 2¼ to 5 cu yd • 130-hp diesel • 23,250 lb • 9,000-lb. carry capacity

move ahead with

ALLIS-CHALMERS

power for a growing world

ALLIS-CHALMERS
TL 20

YOU NEED *These catalogs*

Write directly to the address given or use the Post Card on page 55.

Packs More Refuse

511 The 25% more available capacity in Hobbs-Hydepak refuse collection bodies means crews can make more pickups, load more refuse per trip and reduce costly trips to the disposal site. In addition, collection is sanitary, safe and odorless. For details, Write HOBBS-HYDEPAK DIVISION, HOBBS TRAILERS, 611 N. MAIN, FORT WORTH, TEXAS.

Husky Mower Cuts Clean

512 Looking for a rugged mower of flexible design? One that mows 15 feet in a single pass through weeds, brush or grass? One that gets the job done quickly, economically, thoroughly? One well suited for mowing highways and right-of-ways? Then write to SPECIALTY MFG. CO., INC., 1408 CENTER ST., HOUSTON 7, TEXAS. Ask for literature on Terrain King.

Spreaders for Ice Control, Seal Coating

513 A new 8-page catalog gives features, specifications and user statements on the Fox Mountable Materials Spreader, designed for one-man operation with dash-mounted controls and able to spread in widths up to 40' at speeds up to 40 mph. Mounting and demounting takes only 15 minutes. Write FOX RIVER TRACTOR CO., BOX 469, APPLETON, WIS.

Designed to Handle Large Capacities of Water

514 *Bulletin* 1005 describes the features, construction and advantages of De Laval single stage double suction Types T, U and W centrifugal pumps, each with capacities up to 100 million gallons per day. It points out that pump parts can be inspected without disturbing suction or discharge pipe connections. Write DE LAVAL STEAM TURBINE CO., TRENTON 2, N. J.

Reflective Traffic Signing

515 Useful information on this very important subject is available from FLEX-O-LITE MFG. CORP., 8301 FLEX-O-LITE DRIVE, P. O. BOX 3066 (AFTON BRANCH), ST. LOUIS 23, MO., in the form of complete data on UB 68 medium index reflective beads, bulletin on #831 high index beads and specifications on a new, improved 48" bead dispenser.

Do Your Pavement Markings Work Full Time?

516 Are they clean and bright during the day? Brilliant in the dark? Retain their reflectivity in fair and foul weather? *Catalog* B-160 can help you give your community the protection of long-lasting, life-saving traffic striping. Write CATAPHOTE CORP., TOLEDO 10, OHIO.

For Better Street Patches

517 Heat-A-Mix is a tailgate asphalt mixer designed for heating and remixing stockpiled asphalt. It has its own gasoline engine and propane or kerosene heating system, and can be operated in forward and reverse for better blending of material. Asphalt is made hot and workable by indirect heat. Descriptive literature is available from WYLIE MFG. CO., INC., P. O. BOX 7086, OKLAHOMA CITY 12, OKLA.

Solve Drainage Problems Economically

518 A new 4-page folder (ADV. 1101) lists the advantages of Free Flow sewer pipe, a riveted corrugated metal pipe with a smooth asphalt lining. Descriptions and guide specifications are included, along with tables showing the relationship between sewer loading and gages of metal pipe. For a copy, write REPUBLIC STEEL CORP., ADVERTISING DIV., 1441 REPUBLIC BLDG., CLEVELAND 1, OHIO.

Fibres for Your Street Sweeper Brooms

519 Top quality fibres for street sweeper and gutter brooms, readily available at competitive prices, are described in literature offered by FLO-PAC FIBRES, INC., 1501 4th AVE. S., MINNEAPOLIS 4, MINN. Fibres include flat steel wire, Palmyra stalks, African bass, split hickory. Samples can be obtained.

Portable Collator

520 This unit has been developed for offices that do not require elaborate equipment for gathering multiple pages or reports, bulletins and catalogs. With it, 6,000 pages can be assembled per hour. It accommodates paper up to 17"x11" in size, weighs 7 pounds, occupies 1½ feet of desk space. For full facts, write A. P. HEINZ CO., 2422 LUNT AVE., CHICAGO 45, ILL.

Earth-Boring and Drilling Equipment

521 Looking for a way to speed installation of sewers, utility poles and distribution lines? A new earth-boring and drilling catalog might provide you with a low-cost answer. It describes the big Ka-Mo line. For a copy, write KWIK-MIX CO., KA-MO TOOLS DEPT., PORT WASHINGTON, WIS.

Construction Equipment

522 A 24-page folder designed for pocket reference depicts, in brief, the complete line of construction equipment manufactured by the CONSTRUCTION EQUIPMENT DIV., INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL. When requesting copies, ask for *Folder* CR-650-E.

Step Up Brush Removal Operations

523 "Chip Dollars From Your Overhead" has been brought up to date. It shows the Fitchburg wood chipper in action, explains how it speeds brush removal operations and helps you reduce costs at the same time. For a copy, write FITCHBURG ENGINEERING CORP., DEPT. AC-63, FITCHBURG, MASS.

Controls Temperatures or Pressures

524 Mercury switch equipped controls for pressures, temperatures, liquid level and mechanical movement, as well as transference-relays and hermetically sealed mercury switches, are illustrated and described in 56-page *Catalog* No. 860. For a copy, write THE MERCOID CORP., 4201 BELMONT AVE., CHICAGO 41, ILL.

New Swimming Pool Catalog

525 The current 5-color catalog of Chester all-aluminum swimming pools shows typical indoor and outdoor installations up to 50 meters in length for municipalities, institutions and community swim clubs. For a copy, and details on a free pool planning service, write CHESTER PRODUCTS, BELLE AVENUE & B&O R.R., HAMILTON, OHIO.

These Meters Are Protected Against Dirt and Damage

526 When outdoor installation in pits or other areas is specified, you'll want a water meter that's equipped with a fast-reading, nonfogging, sealed metal register box that's impervious to moisture and dampness, keeps foreign matter out, avoids corrosion and lessens wear. *Bulletin* 58 gives facts on such a meter. Write BUFFALO METER CO., INC., 2902 MAIN ST., BUFFALO 14, N. Y.

Portable Stump Cutter

527 This lightweight, one-man operated unit cuts stumps up to 10" below ground-level, cutting 2"x2" on each swing. It is equipped with a 5.5-hp chain saw power head with automatic clutch and uses carbide cutting bits. Descriptive literature reports it to be fast-cutting and easy to operate. Write H. and H. MFG. & SUPPLY CO., P. O. BOX 345, GREENFIELD, MASS.

Clay Sewer Pipe Gets Strong, Tight Seal

528 NATCO CORP., 327 FIFTH AVE., PITTSBURGH 22, PA., announces that Natco clay sewer pipe is now available with "Vitri-Seal" joints, a compression type seal that is self-aligning, leakproof, resilient, rootproof and acid and alkali resistant. Descriptive literature available on request.

Tells Rate of Flow at a Glance

529 The Ford Testerate Indicator connects easily to any water meter testing outfit. It provides quick, precise readings of rates of flow in gallons per minute. Accuracy is within 2% down to 1 gpm; the operator can make corrected readings with rates of flow as small as ¼ gpm. For full facts, write THE FORD METER BOX CO., INC., WABASH, IND.

What's New in Sewage Treatment for the Small Community

530 If yours is a small community interested in up-to-date sewage handling methods, send for *Bulletin* No. 6692. It has just been published and tells of new developments in low-cost sewage treatment plants for communities up to 10,000 population. Write DORR-OLIVER INC., STAMFORD, CONN.

Tractors and Equipment

531 Utility tractors that are rock-solid stable on straightaway and slope, easy to maneuver in tight quarters, available with companion equipment to match your needs and with 31 to 63 engine horsepower, are described in current literature from ALLIS-CHALMERS MFG. CO., UTILITY TRACTORS & EQUIPMENT, MILWAUKEE 1, WIS.

Fabrics for Municipal Uniforms

532 By writing to DAVID E. SINGER, SALES AGENT, FRANKLIN WORSTED CO., 40 E. 34th ST., NEW YORK 16, N. Y., you can obtain information on top quality cloth for police and fire department uniforms—made in all weights, for all climates, stock-dyed, 2-ply, fast colors, uniform in shade.

Dictating Machines

533 Two instruments that will measurably help the busy municipal official reduce his paper work, make more efficient use of his time and give him more time for public service are the Voicewriter and a 3-pound battery-operated tape recorder. Both are described in literature available from EDISON VOICEWRITER, DEPT. AC-2, WEST ORANGE, N. J.

(See page 58 for more Bulletins)

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

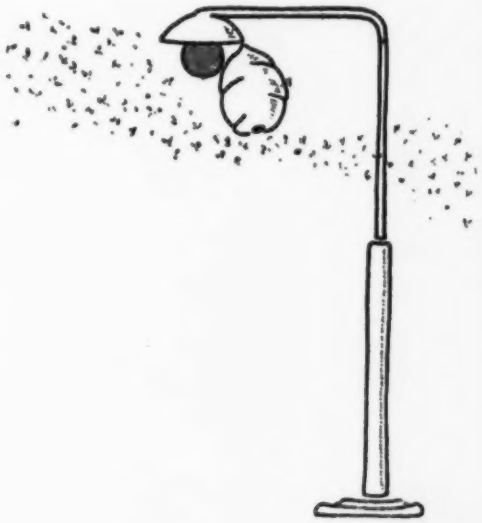
BUSINESS REPLY CARD
FIRST CLASS PERMIT No. 281, SEC. 34.9 P. L. & R., NEW YORK, N. Y.

THE AMERICAN CITY MAGAZINE

470 PARK AVENUE SOUTH

NEW YORK 16, N. Y.

IN THE DARK?



If you need information on any type of municipal service or equipment, these reply cards will get action in a hurry.

To THE AMERICAN CITY's Catalog Supply Department:
Please send literature on items numbered as follows, starting on page 48

483	495	507	519	531	543	555	567	579	591	603
484	496	508	520	532	544	556	568	580	592	604
485	497	509	521	533	545	557	569	581	593	605
486	498	510	522	534	546	558	570	582	594	606
487	499	511	523	535	547	559	571	583	595	607
488	500	512	524	536	548	560	572	584	596	608
489	501	513	525	537	549	561	573	585	597	609
490	502	514	526	538	550	562	574	586	598	610
491	503	515	527	539	551	563	575	587	599	611
492	504	516	528	540	552	564	576	588	600	612
493	505	517	529	541	553	565	577	589	601	
494	506	518	530	542	554	566	578	590	602	

I would also like to receive manufacturer's booklets on.....

.....

.....

.....

Name: (Please Print).....

Title:.....

Address:.....

..... 3-60

A Listing of Your Business Connection Is Important

To THE AMERICAN CITY's Catalog Supply Departments

Please send me further information on products described in "Purchasing News" section beginning on page 215, as circled below:

844	849	854	859	864	869	874	879	884	889	894
845	850	855	860	865	870	875	880	885	890	895
846	851	856	861	866	871	876	881	886	891	896
847	852	857	862	867	872	877	882	887	892	897
848	853	858	863	868	873	878	883	888	893	898

I would also like to receive manufacturer's booklets on: .....

.....

.....

Name: (Please Print) .....

Title: .....

Address: .....

..... 3-60

A Listing of Your Business Connection Is Important

HERE'S A SOLUTION

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT No. 281, SEC. 34.9 P. L. & R., NEW YORK, N. Y.

THE AMERICAN CITY MAGAZINE

470 PARK AVENUE SOUTH

NEW YORK 16, N. Y.

Save time and effort by using these reply cards when you want additional information on any product or service mentioned or advertised in this issue.

8 out of 10 Sanitary Engineers assure

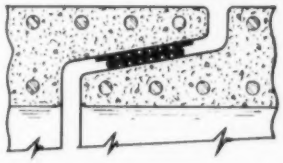
water-tight pipe joints

by using

TYLOX *flexible* GASKETS

There are more TYLOX Rubber and Neoprene Gaskets in low head service than all other types of gaskets combined! . . . Most waste disposal designers specify TYLOX Gaskets, knowing from experience that they prevent water from leaking *in* or *out* of pipe joints. The diagram below of a TYLOX Type "A" Gasket on straight T & G pipe shows how . . .

Whether you are planning pipe lines of B & S, T & G, offset or recessed pipe of *any* size, there's a Tylox Rubber or Neoprene Gasket in the Hamilton Kent family of true compression Gaskets to make the joints water-tight for the life of the pipe itself. If you are not already thoroughly familiar with the advantages of TYLOX Gaskets, write for full information and engineering details.



TYLOX prevents joint leakage with a compression-tight seal. It reduces pipe-laying costs with quick assembly and fast pipe coupling. Acid-resistant, TYLOX never deteriorates.

This TYLOX GASKETED PIPE is being used on the following sewer installation:

PROJECT: West Side Trunk Sewer, West Side Sanitary District, County of Onondaga, New York, Onondaga Public Works Commission.

ENGINEERS: O'Brien & Gere, Consulting Engineers, Syracuse, N. Y.

CONTRACTOR: M. A. Bongiovanni, Inc., Syracuse, N. Y.

PIPE: Reinforced Concrete T & G Pipe, Manufactured by American-Marietta Company, Concrete Products Division, Syracuse District, Syracuse, N. Y.

HAMILTON KENT MANUFACTURING COMPANY

KENT, OHIO

427 West Grant St. ORchard 3-9555

5133

CANADIAN PLANT: 10 Brussels St., New Toronto, Ont., Phone CLifford 1-2494

CATALOGS *for Improved Municipal Services*

Write directly to the address given or use the Post Card on page 55.

Automatic Toll Collector

534 A revenue-control system for multi-level parking garages and parking lots offers fully recorded account of axles in and out and the monies collected. For descriptions, layouts and specifications, write TALLER & COOPER, INC., 75 FRONT ST., BROOKLYN 1, N. Y.

Keeps Keys from Straying

535 Here is a convenient key control system that stops time wasted locating lost or borrowed keys, guarantees security and privacy, eliminates expensive lock replacement and repairs. The *Telkee Booklet* gives all the facts. For a copy, write P. O. MOORE, INC., GLEN RIDDLE 27, PA.

For Better Filing

536 Here's a file system that's different —in capacity, mobility, ease of finding and filing. It will help you speed and smooth operations at the office. For full facts, write DEPT. MB-360, REVO-FILE DIVISION, THE MOSLER SAFE CO., 320 FIFTH AVE., NEW YORK 1, N. Y.

Make Your Water Well a Profitable Producer

537 Whatever the type of your well, whatever the nature of its service requirements, you'll find Halliburton, a leader in well techniques and services, able to help you increase the life of your well and boost water yield from reservoirs. For details, write HALLIBURTON OIL WELL CEMENTING CO., DUNCAN, OKLA.

For Asphalt or Concrete Curbs

538 An automatic curber extrudes compacted bituminous concrete or portland cement concrete curbs within 1" of obstructions, up or down hills and around radii, at the rate of 2,500-3,000 feet per day. It is called the Stephens-Canfield Model 56W. For descriptive literature, write POWER CURBERS, INC., SALISBURY, N. C.

High-Frequency F-M Radio Receiver

539 City officials, fire or police chiefs who want to listen to all messages sent and received by their 2-way radio-equipped vehicles will find this crystal-controlled, fully transformer-powered unit will enable them to do so. It offers long-range reception, low cost and high sensitivity. For complete information, write PLECTRON CORP., DEPT. ACM-1, OVERTON, NEB.

100% Kill of Mosquito Larvae

540 This capsulated killer of mosquito larvae spares no specie, gives 100% kill in all breeding places. When tossed into infested water, the capsule dissolves, spreading a lethal film in all directions on the water's surface. The Tossit catalog gives full details; for a copy, write WYCO INTERNATIONAL, 4811 CARNEGIE AVE., CLEVELAND 3, OHIO.

Fire Fighting Equipment

541 Whether your fire department be large or small, urban or rural, volunteer or paid, it will find much valuable information in *Fire Fighting Equipment Catalog* No. 105, available from SARGENT-SOWELL, INC., P. O. BOX 810, GRAND PRAIRIE, TEXAS.

Assure Watertight Pipe Joints

542 You can prevent joint leakage in sewer installations with acid-resistant compression-tight gaskets. Full information and engineering details on Tylox rubber and Neoprene gaskets for B & S, T & G, offset or recessed pipe of any size can be obtained from HAMILTON KENT MFG. CO., 427 W. GRANT ST., KENT, OHIO.

Long Pitch Pintle Chain for Sewage Service

543 This chain is rugged. It is proportioned to give maximum strength with minimum weight and is designed to prevent the entrance of grit. Pin or rivet holes are accurately dimensioned. You'll find it well suited for use with scum removers, grit washers and sludge collectors. For complete information, write MOLINE MALLEABLE IRON CO., ST. CHARLES, ILL.

Pave, Patch— Fast and at Low Cost

544 Ideally suited for use on driveways, curbings, patching, parking lots, runways, the 200-pound Ken-Pave heated compaction roller gives heated compaction equal to a 5-ton power roller. Maximum heat develops in 10 minutes; propane fuel lasts approximately 8 hours. The unit rolls flush to obstructions, gives smooth finish-sealed surface. Write PFAHLER MFG. CO., GALION, OHIO.

(See page 60 for more Bulletins)

This Changing World

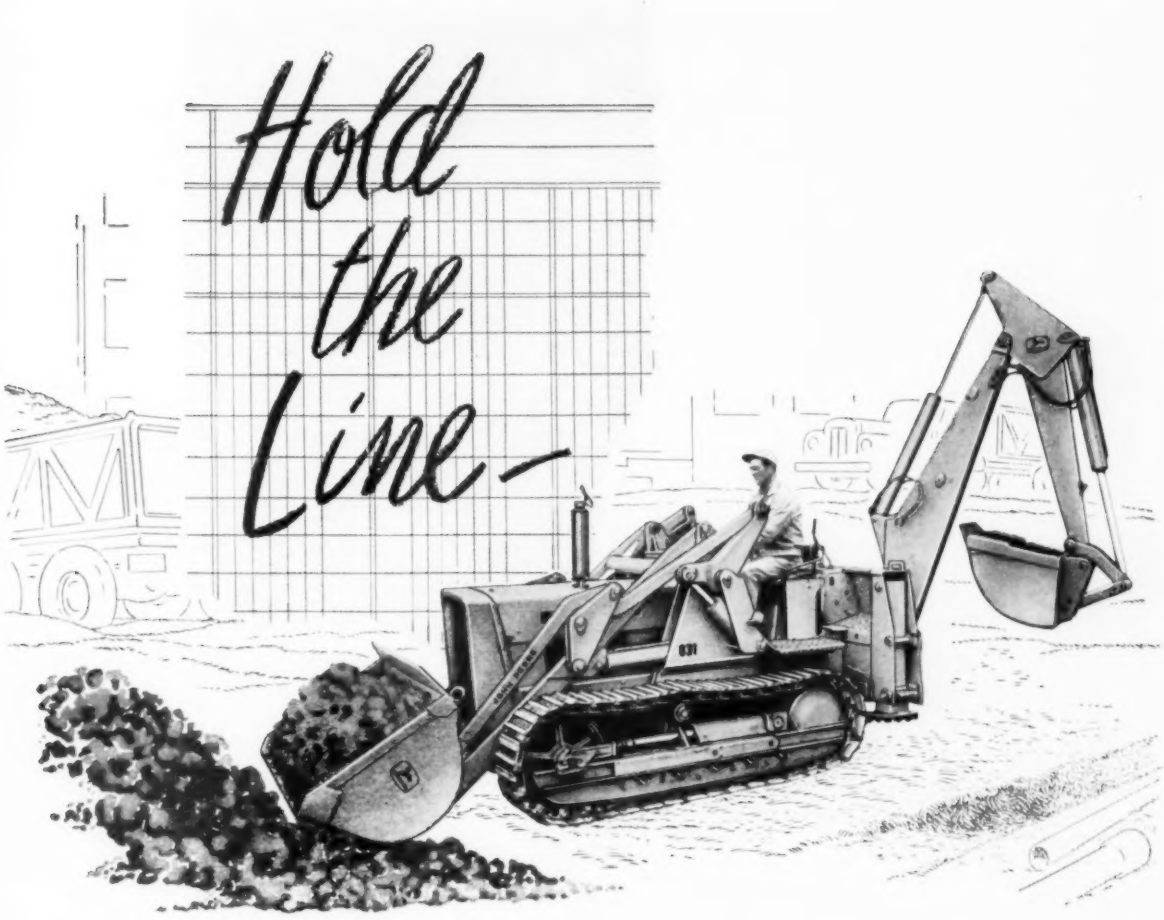
For hundreds of years, the fastest Man could travel was by riding a running horse at about 35 miles per hour. In 1830 the steam engine was invented, and then in 1910 the airplane which today travels at over 600 miles per hour. Man's weapons have changed from a sling-shot to a spear to a bow-and-arrow to gun-powder to nuclear bombs. The only thing which never changes is change itself . . . change goes on almost continuously in myriad ways.

American cities have been steadily increasing in population and likewise spreading out into suburbs and "suburbs of suburbs". So more water is needed and distribution mains need to be longer with more valves and fire hydrants and more footage of main per customer. Engineering experts agree that to give adequate service, U. S. water and sewage facilities today need to be doubled!

Why do so many people face this spectacle of almost continuous and eternal change with a stoical indifference which history shows often has been an obstacle in the path of progress? Why not ask John Q. Public for advice? He might be flattered. He might realize that the water problem is his problem too, and become more interested in its solution.

This series is an attempt to put into words some appreciation of the water works men of the United States.

M&H VALVE
AND FITTINGS COMPANY
ANNISTON, ALABAMA
SUBSIDIARY OF WALWORTH



with the cost-cutting help of this new JOHN DEERE LOADER-BACKHOE

Here's the outfit that's making a lot of cost figures obsolete—giving many municipalities a welcome break on construction expenses.

The reasons are low first cost and outstanding fuel economy, plus consistently high work output.

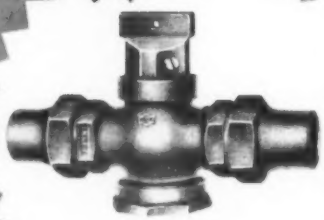
Self-leveling, the new 831 Loader gets the 7/8-yard heaped load into the truck fast—and with a minimum of effort. When bucket is dumped from full height, it returns to digging angle by use of the *boom-control only*. A 35-degree bucket roll-back provides the heavy pry-out needed for full loads.

The 51 Backhoe combines 2-lever digging with plenty of power and unusual flexibility. In minutes, one man out on the job can set the boom-mounting to any of five positions from flush left to flush right, using only a wrench.

For details, and a demonstration, see your John Deere Industrial Dealer.

JOHN DEERE
INDUSTRIAL DIVISION
3300 River Drive
MOLINE, ILLINOIS
Dept. 546

JOHN DEERE *"Specialists in Low-Cost Power with a Heavyweight Punch"*

FOR
QUALITY
water service products
IT PAYS TO BUY
HAYS®

CURB STOPS
one of a complete line of water service products
GENERAL PRODUCTS DIVISION
HAYS MFG. CO.
ERIE, PA.

FREE catalogs

Write directly to the address given or use the Post Card on page 55.

Keeps Track of Police Cars and Fire Trucks

545 There is available a police control board system that displays a continuously correct inventory of squad cars—their availability and where they are. Another public safety system is a map-type display board which shows location and status of each piece of fire equipment. For details on both systems, write GENERAL RAILWAY SIGNAL CO., P. O. BOX 600, ROCHESTER 2, N. Y.

Precise Surveying Instruments

546 *Booklet* N-III will acquaint you with three models of a high precision level that meets rigid standards of accuracy, dependability and ruggedness. These instruments are easy and quick to set up and operate and have tilting screw, coincidence level and built-in optical micrometer. Write WILD HEERBRUGG INSTRUMENTS, INC., MAIN at COVERT STREET, PORT WASHINGTON, N. Y.

Nonclogging Pump Strainer

547 These strainers permit continuous delivery of fast, free-flowing, silt- and sand-free water. They are available in all standard diameters, with slot sizes as required, in wire wound and brass tube types. For descriptive literature, write COOK WELL STRAINER CO., 6330 GLENWAY AVE., CINCINNATI 11, OHIO.

Protective Fencing

548 A permanent, low-cost way to protect municipal play areas, parking lots and other areas where safety and limited access are desirable, is to enclose them with Realock Fence, a sturdy, weather- and corrosion-resistant fabric available in steel or aluminum. For details, write COLORADO FUEL & IRON CORP., BUFFALO, N. Y.; DENVER, COLO.; OAKLAND, CALIF.

Closed Circuit TV for Remote Municipal Observation

549 Closed-circuit television allows remote observation of widely separated events occurring at great distances from the observer. Do you know how this quality can bring greater efficiency to various municipal operations? If you don't, ask ITT INDUSTRIAL PRODUCTS DIV., 15191 BLEDSOE ST., SAN FERNANDO, CALIF.

A Water Meter of Unusual Design

550 This water meter boasts a conical disc piston and a three-part measuring chamber, components that measurably increase its sensitivity and accuracy and contribute to easier, lower cost maintenance. *Catalog* No. H2 gives full facts. For a copy, write HERSEY-SPARLING METER CO., DEDHAM, MASS.

Spreads Sand, Gravel, Slag, Salt

551 This spreader comes in 6 models for spread widths of 8, 9, 10, 11, 12 and 13 feet. It is ideal for parking lot, street and highway construction and maintenance. Spreading of materials is smooth and accurate, from powder fine to 3" depths. For complete details, write GOOD ROADS MACHINERY CORP., MINERVA, OHIO.

A Multipurpose Machine

552 When you put a clam-action 4-in-1 to work you get a machine that spreads, levels, covers and compacts refuse for sanitary fill, a unit to do rough and finish grading with close-in accuracy, big bulldozing capacity, power-shovel-like excavating power, a loader able to handle even sticky materials. For details, write DROTT MFG. CO., MILWAUKEE 15, WIS.

Long-Lasting Traffic Marking

553 A new brochure shows latest installations and specifications of Perma-Line, a thermoplastic traffic marking material of high visibility, durability and *guaranteed* safety protection that applies quickly, dries almost instantly and meets the strict safety standards of the new Interstate Highway System. Write VEON CHEMICAL CORP., 22-09 BRIDGE PLAZA NORTH, LONG ISLAND CITY 1, N. Y.

Brass Goods for Water Service

554 The McDonald 4701 corporation stop with Standard A.W.W.A. thread for copper service pipe comes in sizes from ½" to 2". It is just one product in a complete line of brass goods for water service illustrated and described in catalog literature available from A. Y. MCDONALD MFG. CO., DEPT. AC-360, 12TH & PINE, DUBUQUE, IA.

Park Maintenance Equipment

555 Action photos in a new 8-page booklet show versatility of Ford tractors and equipment for roadside and park mowing and mulching, street and parking lot cleaning and snow removal, landscaping, and other grounds maintenance jobs. Write INDUSTRIAL SALES DEPT., TRACTOR AND IMPLEMENT DIVISION, FORD MOTOR CO., 2500 E. MAPLE, BIRMINGHAM, MICH.

Diesel Engine Catalog

556 The two heavy-duty diesel engines (UDT-817 and UD-817) described in 16-page *Catalog* CR-607-I are designed for versatile application and profitable use on irrigation pumps, as prime power for earthmovers, on-and-off highway trucks, on generator sets and all types of big pumps. Write INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Heavy-Duty Rotary Mower

557 Model 80 Rotary Mower-Shredder is finding growing application in highway right-of-way mowing and cemeteries and parks. Tractor-towed, it cuts an 80" swath. It is built by WOOD BROTHERS MFG. CO., OREGON, ILL., and features an unusual drive design in which back side idler pulleys enable three V-belts to achieve power transmission with high shock resistance.

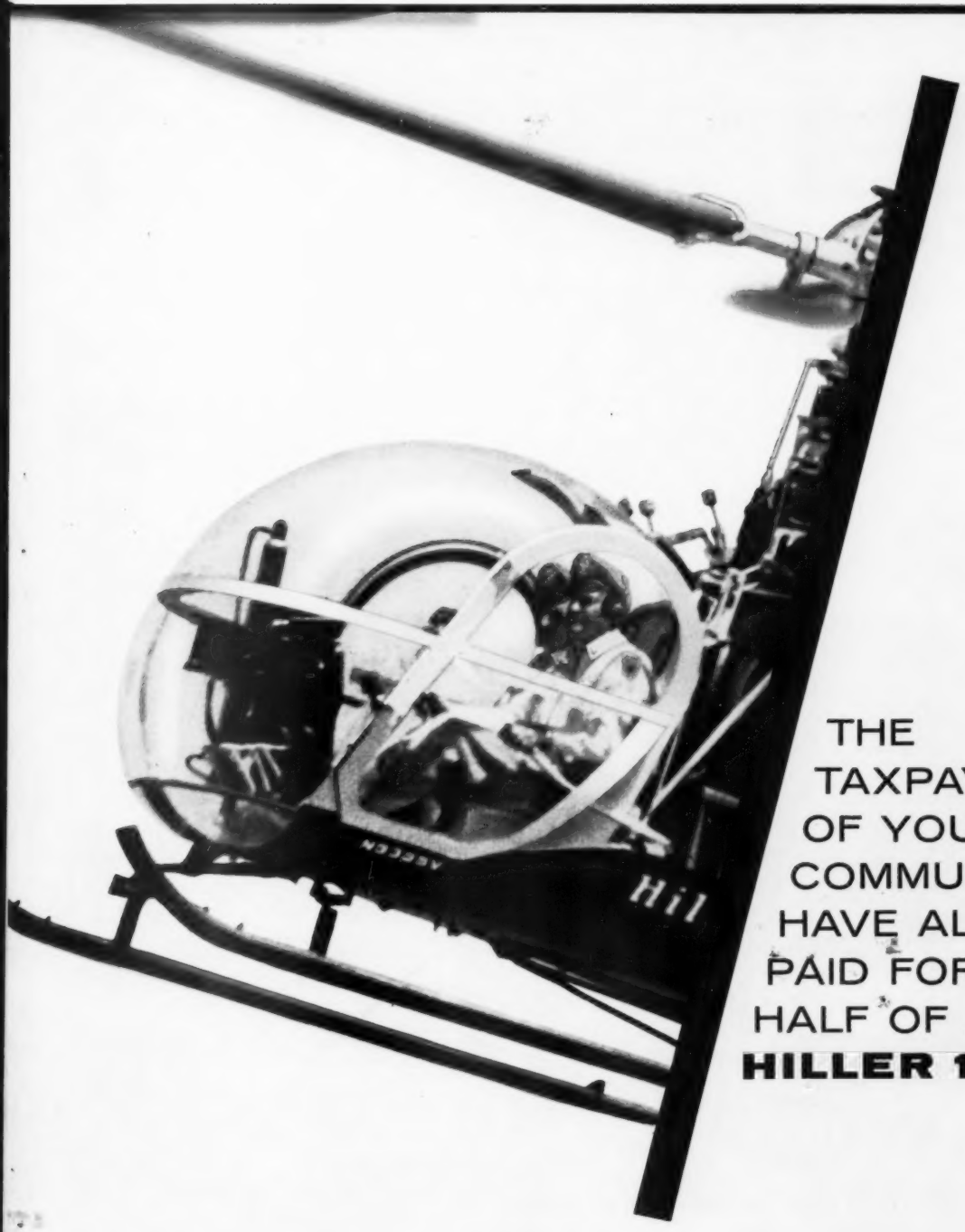
What's New in Fluorescents?

558 In the Westinghouse line, which ranges from tiny 4-watt lamps for instrument lighting to the giant 96-inch Super-Hi lamps for street and store lighting there are six important advances, all contributing to trouble-free efficient lighting. For literature, write WESTINGHOUSE LAMP DIV., WESTINGHOUSE ELECTRIC CORP., BLOOMFIELD, N. J.

Sweep Streets Clean

559 Two highly maneuverable rear-broom street sweepers—Model 60, 4-plus yard and Model 40, 2-yard—offering full operator visibility, rear dumping action, automatic flushing system, single or dual gutter brooms and a sectional spray bar to put water where it's needed, are detailed in literature available from AUSTIN-WESTERN CONSTRUCTION MACHINERY DIV., BALDWIN-LIMA-HAMILTON, AURORA, ILL.

(See page 62 for more Bulletins)



THE TAXPAYERS OF YOUR COMMUNITY HAVE ALREADY PAID FOR HALF OF A **HILLER 12 E**

THE OTHER HALF, IS A LASTING INVESTMENT IN CIVIL PROTECTION AND PREPAREDNESS

No other vehicle can equal the helicopter for versatility...for fly anywhere, ***land anywhere*** *ability. That's why the Office of Civil and Defense Mobilization will match your community's funds toward the purchase price of the Hiller 12 E —* ***the most powerful light utility helicopter available under the matching funds program.*** *Your community can qualify — the OCDM is ready to help — the decision is up to you.*

Free, *our new brochure, "America's New Mounted Police," describes established community helicopter practices, OCDM procedures, the Hiller 12 E and its emergency accessories available under the matching funds program, plus Hiller services, including free demonstrations for officials of states and their subdivisions. Write today, Commercial Division.*

HILLER AIRCRAFT CORPORATION PALO ALTO, CALIFORNIA

MONEY SAVING *catalogs*

Write directly to the address given or use the Post Card on page 55.

Dependable Fire Apparatus

560 Pumpers. Squad and hose wagons. Aerials. Combination ladder trucks. Mack custom-builds them all to be efficient, trouble-free and top-performing by matching components exactly so they function as integrated apparatus. Cab-forward and conventional units available. For full facts, write MACK FIRE APPARATUS, ALLENTOWN, PA.

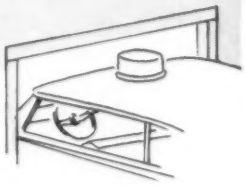
Rugged New Line of Trucks

561 The short new Chevrolet tilt cab truck line includes 20 new models in 5 series, all offering the advantages of roomier cab, compactness, extra payload capacity, easy maintenance, maneuverability and torsion-spring ride. For details, write CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICH.

Economical Departmental Car

562 Metropolitan Dade County, Fla., bought 50 Larks; four months later it added another 116 to its departmental car fleet. Reasons? Maneuverability, easy parking, 21% lower operating expense and gas mileage of 16 to 26 miles a gallon. For informative literature, write DEPT. AC 3-60, FLEET SALES DIVISION, STUDEBAKER-PACKARD CORP., SOUTH BEND 27, IND.

LONGER SIGHT...



Only the NEW DIETZ

REVOLVING LIGHT gives you all these advantages

- Greater lens area—complete 360° visibility over greater distances
- Lower height—only 8¾ inches
- The frequency beam can be 30, 60 or 120 per minute according to number of sealed beam bulbs installed—one, two or four bulbs respectively.
- Dome lens easy to remove—only necessary to remove one brass bolt
- Rust-proof chrome-plated brass base and lens rim mounts on thick rubber pad—conforms to contour of car roof
- Shock-resistant lucite dome available in red, amber, blue or clear.

Go DIETZ and you go Safely

Write for complete details

R. E. DIETZ COMPANY, 225 Wilkinson St. Syracuse 1, New York

Fine Street Lighting in Pictures

563 Possibly as good a way as any to understand and appreciate today's street lighting is to look at it. If adequate examples are not readily at hand, here is a collection of fine photographs. They display the last word in business district lighting in 9 cities in 8 states. For a free copy of 12-page *Brochure* GEA-6989, write OUTDOOR LIGHTING DEPT., GENERAL ELECTRIC CO., HENDERSONVILLE, N. C.

Burglar-Resistant Parking Meter

564 This parking meter was developed to thwart vandals and to combat the increasing and costly destruction of equipment and the theft of meter revenue. It features a tamperproof bolted door, burglar-resistive housing and sealed coin box. For full story, write DUNCAN PARKING METER, DIVISION OF MOTOR PRODUCTS CORP., 835 N. WOOD ST., CHICAGO 22, ILL.

New Tools for Drilling Through Reinforced Concrete

565 The current illustrated catalog details the new Truco portable Diamond drilling equipment—5 models plus power combinations—that make it easy for you to drill clean, accurate holes (¼" to 20") through thick reinforced concrete floors and walls. For a copy, write TRUCO MASONRY DRILLING DIVISION, WHEEL TRUEING CO., 113-3200 W. DAVISON AVE., DETROIT 38, MICH.

Diesel Engines and Generator Sets

566 MURPHY DIESEL CO., 5317 W. BURNHAM ST., MILWAUKEE 19, WIS., recently introduced its MP Series diesel engines and power units, in sizes from 105 hp to 320 hp, and generator sets in capacities from 60 kw to 188 kw. A 48-page booklet, entitled "Before You Power A Job," describes the design and construction of the MP Series diesels.

Solve Joint Sealing Problems

567 . . . with an easy-to-apply, quick-curing seal that has neither gravity nor cold flow tendencies (even at temperatures in excess of 200°F.), can withstand punishment without damage, and is said to have an expectant life of 500% over presently used materials. For descriptive literature on Jet Seal, write ALLIED MATERIALS CORP., ALLIED BLDG., 5101 N. PENNSYLVANIA, P. O. BOX 7103, 39th ST. STATION, OKLAHOMA CITY 12, OKLA.

Free Folder and Strength Test Sample

568 . . . on a sturdy new recording tape, designed to hold up under play-back conditions involving frequent repeat, continuous play and constant handling is offered by 3M CO., DEPT. EO-41, 900 BUSH AVE., ST. PAUL 6, MINN. The new "Scotch" brand No. 311 magnetic tape is tear-, stretch-, and moisture-resistant. It is priced in the same range as standard acetate-backed tapes.

Cast Iron Pipe

569 . . . and water supply systems have been a team for centuries. Today cast iron pipe gives greater assurances: inherent ruggedness; a free, steady flow of water; leak protection at your system's most vulnerable joints; great beam strength to resist heavy surface traffic; load resistance to absorb forceful pressures. Write CAST IRON PIPE RESEARCH ASSOCIATION, THOS. F. WOLFE, MANAGING DIR., 3440 PRUDENTIAL PLAZA, CHICAGO 1, ILL.

(See page 65 for more Bulletins)

Fire Chief G. L. Sartain and Fire Alarm Superintendent B. M. Pointer of Tulsa, Oklahoma (left to right), check operations in fire alarm headquarters. City's modernized Gamewell System unerringly guides 21 engine companies, 5 ladder companies, and 4 chief cars.

How Tulsa's Fire Fighters get the edge on fires

In Tulsa, Oklahoma, a modernized Gamewell Fire Alarm System gives fire fighters a real jump on fires. It alerts precisely the number of companies needed to fight a blaze . . . and permits them to respond to the alarm without even having to check its location!

When the alarm comes into the alarm center (above) the dispatcher merely checks a card file for company assignment. Then by radio he quickly and accurately dispatches the proper assignment of men and equipment. Code signal confirmation of the alarm is then transmitted to all stations. The efficiency of the new system will greatly benefit property owners in the city of Tulsa . . . faster response to each alarm will give the fire fighters an "edge" on the fire.

The new Gamewell System was precisely tailored to the specifications of Tulsa Fire Chief G. L. Sartain and Fire Alarm Superintendent B. M. Pointer. It includes 8 alarm circuits, 24 box circuits, a new PBX system, and voice dispatching equipment. There are now 264 street type boxes as well as 65 Master Boxes located in schools, public buildings, industrial plants, hospitals, and institutions.

Rapidly expanding Tulsa had simply outgrown its former 25-year-old Gamewell Fire Alarm System and wisely took steps to keep lives and property adequately protected. Are *your* city's fire alarm facilities keeping pace with growth? A Gamewell Survey will answer this question. No obligation. Write THE GAMEWELL COMPANY, 1274 Chestnut Street, Newton Upper Falls 64, Mass.

Gamewell®

FIRST...WHEN SECONDS COUNT

THE WILD N-III HIGH PRECISION LEVEL is universally accepted as the standard wherever absolute accuracy, dependability and ruggedness are paramount considerations. The N-III is easy and quick to set up and operate.

Three models are available to meet both field and industrial requirements, reading direct to .1 mm; .001 inch; .0005 ft.

All have tilting screw, coincidence level and built-in optical micrometer.

Write for Booklet N-III.

WILD
HEERBRUGG
INSTRUMENTS, INC.
Main at Court St. • Port Washington, N.Y. • PO rt Washington 7-4843
FULL FACTORY SERVICES

YOU NEED *These catalogs*

Write directly to the address given or use the Post Card on page 55.

It's Good Public Relations

570 . . . it's convenient and it adds to revenue to have your metered off-street parking lots and garages equipped with coin changing machines. Over 50 cities have found this to be so. For full facts, write STANDARD CHANGE-MAKERS, INC., 422 E. NEW YORK ST., INDIANAPOLIS 2, IND., manufacturer of single and multiple coin changers and related coin handling equipment.

Ladder-Type Trencher Small in Size, Big in Capacity

571 This trencher was developed especially for city work. It's low and compact, handles everything from mainline extension to pipe reclamation and residential service connections, and cuts 16 to 26 inches wide, at depths to 10 feet, and digs from 5.8" to 25 lineal feet per minute. For literature on the 155 Trenchliner, write PARSONS CO., NEWTON, IA.

Police Car Bulletin

572 The *Dart Pursuit Brochure* gives full facts on a fast, responsive, solidly-built, low-priced police car, available with a wide choice of engines and transmissions, in two-door, four-door and station wagon models. For a copy, write ADVERTISING DEPT., BOX 1259, DODGE DIVISION, CHRYSLER CORP., DETROIT, MICH.

Dual-Drive Aerial Crane

573 Lifting job to be done? Want it done quickly, efficiently? The Sky Hook, with 2-speed load-lifting cable, can help. It is built in 5 heavy-duty all-powered sizes, and two lightweight sizes, both manually operated, and can be installed on any truck from 1½-ton up. For descriptive literature, write BALDWIN-WARD MFG. CO., BOX 285, OTTAWA, KAN.

For Better Municipal Refuse Incineration

574 For information on new, improved fly-ash control, nonclog dust collectors, spray towers and safety features and controls for municipal incinerators, write MORSE BOULGER INC., DEPT. AA, 80 FIFTH AVE., NEW YORK 11, N. Y. Ask for *Bulletin* III-D, also; it gives details on a Cylindrical Mechanical Stoker with automatic, continuous positive stoking.

Sewer Pipe Bulletin

575 If your responsibility is the installation of sewer mains and house laterals, you'll want to get a copy of a new 8-page booklet, TR-206A, which is packed full of information and interesting facts on Transite sewer pipe. It is available from JOHNS-MANVILLE, BOX 14 (AC-3), NEW YORK 16, N. Y.

These Trucks Are Economical to Operate

576 In the second running of Economy Showdown U.S.A., an over-all economy test conducted by a leading independent research organization, the standard 1960 ½-ton Ford Six pickup trucks delivered 13.1% more miles per gallon than did competitive trucks. For full facts and descriptive literature, write FORD MOTOR CO., TRUCK DIVISION, P. O. BOX 658, DEARBORN, MICH.

(See page 66 for more Bulletins)

Don't let the performance or handling fool you—

Dart is a low-priced police car!

You would never know by the way it performs and handles that the Dodge Dart Pursuit was a low-priced car.

You slip behind the wheel and find the kind of room and comfort you would only expect in more expensive models. The dimensions are generous. The seats designed for proper support for long hours of duty.

You take to the road and learn that this Dart Pursuit is a tremendous performer also. It's fast and responsive. It holds the road beautifully. It tracks with a sure and deft precision under all conditions.

And Dart's new one-piece, all-welded Unibody construction gives it a solidity and a soundness never before found in any other police car *at any price.*

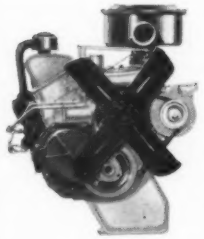
There are many other things to recommend Dart Pursuits for your particular application. A wide choice of engines and transmissions. A selection of two-door, four-door and station wagon models. Why not get *all* the facts today?

* * *

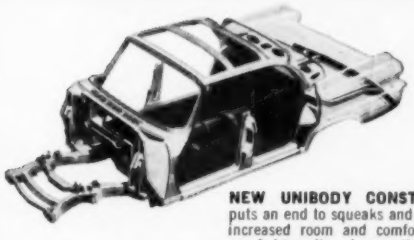
For complete details and specifications, see your nearest Dodge Dealer or write for free Dart Pursuit Brochure, Advertising Department, Box 1259, Dodge Division, Chrysler Corporation, Detroit, Michigan.

DODGE DART

POLICE PURSUITS FOR 1960



NEW ECONOMY SLANT "6" —the engine that acts like an "eight," yet saves like a "six." Unique slant-block design permits engine to breathe better, breathe deeper, burn fuel more evenly. 225 cu. in. displacement, 8.5 to 1 compression ratio, 145 h.p. at 4000 r.p.m., 215 lb.-ft. torque at 2800 r.p.m.



NEW UNIBODY CONSTRUCTION— puts an end to squeaks and rattles, gives increased room and comfort. It's rust-proofed too, dipped seven times in special corrosion-resisting compounds.

CATALOGS *for Improved Municipal Services*

Write directly to the address given or use the Post Card on page 55.

Push-Button Water Filters

577 *Bulletin* 480.20-1 gives full facts on Auto-Central filter control systems and explains how they can put your filter plant under push-button control to effect savings in time and money and increase reliability. For a copy, write B-I-F INDUSTRIES, INC., 358 HARRIS AVE., PROVIDENCE 1, R. I.

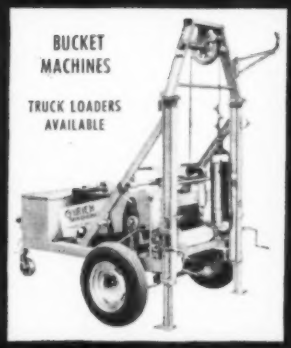
Tapered Steel Lighting Tubes

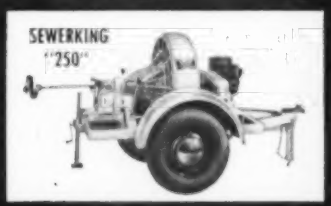
578 For area and floodlighting that is up to date, specify Tulito tapered steel lighting tubes. They are especially engineered for permanence, strength and safety and accommodate from 2 to 40 lights. Illustrated literature gives full facts. Write MEYER MACHINE, INC., P. O. BOX 131, RED WING, MINN.

Cost-Cutting Loader Backhoe

579 This unit offers low first cost, fuel economy and high work output. Its 5-position 51 backhoe combines 2-lever digging with power and flexibility. Its new self-leveling 831 loader gets heaped loads into the truck fast; 35-degree bucket roll back provides heavy pryout. For complete data, write JOHN DEERE INDUSTRIAL DIVISION, DEPT. 546, 3300 RIVER DR., MOLINE, ILL.

YOUR BEST BET





O'Brien sewerking®
–a type to solve your sewer cleaning needs

Whatever your problem come to O'BRIEN for the right, all-power, equipment! Here you will find cable-type rodders, bucket machines, and sectional rod equipment; all designed to save manpower, work better, and last far longer. Really trouble-free sewer cleaners that have reduced costs 50%-75% for many cities! Also, a constant factory stock of tools, cutters, solid rods, and cable, to make O'BRIEN your best bet for service!

WRITE TODAY—*send for illustrated literature, information, and current prices on the complete O'BRIEN line. No obligation. Convenient demonstrations arranged upon request.*

NATIONWIDE SALES & SERVICE
Telephone ROdney 3-7433

O'Brien
MANUFACTURING CORPORATION
DEPT. AC360 5632 NORTHWEST HIGHWAY, CHICAGO 46, ILLINOIS

For Safe, Nonslip Concrete Surfaces

580 *A. I. A. File* No. 3-D describes and gives recommended applications and specifications for silicon carbide and aluminum oxide abrasive grains, which provide an inexpensive and simple method of making concrete surfaces nonslippery and safe. For a copy, write FRANK D. DAVIS CO., 3285 E. 26th ST., LOS ANGELES 23, CALIF.

Refuse Collection Film

581 "The Big-6 Story" is a colorful, sound film. It gives the facts about the efficiency-engineered Load-Packer 600 refuse collection truck body, and will show you why that unit is said to be unmatched for performance in six money-saving ways. To arrange for a showing, write GAR WOOD INDUSTRIES, INC., WAYNE, MICH.

Tax Equalization Appraisals

582 COLE-LAYER-TRUMBLE CO., 11 W. MONUMENT AVE., DAYTON 2, OHIO, offers a quarter-century of experience in producing high quality appraisals for local tax equalization purposes. Literature is available on request.

Speed Engineering, Drafting Operations

583 The Cook County, Ill., Highway Department expedites engineering and drafting operations by using a precision engineering drawing system that saves valuable time and insures greater efficiency. A free booklet giving complete information describes it. For a copy, write RECORDAK CORP., 415 MADISON AVE., NEW YORK 17, N. Y.

Mechanical Street Sweeper Brooms

584 An illustrated brochure gives full facts on these new, round wire street sweeper brushes, which are extra long wearing, clean-sweeping and able to handle dirt, snow, sand and gravel. Write NEWARK BRUSH CO., 260 MICHIGAN AVE., KENILWORTH, N. J.

Elevated Water Tanks

585 The fabricator of elevated water tanks in capacities from 5,000 gallons to 2,000,000 gallons has prepared a highly informative booklet on water storage facilities. Its aim is to help you with your water supply and distribution problems. For a copy of *Tank Talks*, write R. D. COLE MFG. CO., NEWNAN, GA.

Pneumatic Sewage Ejectors

586 *Bulletin* S-55 will bring you up to date on these dependably engineered units, designed to give efficient, economical uninterrupted sewage lift service. Single and duplex units are available—30 to 500 gpm; discharge heads to 50 feet. Write BLACKBURN-SMITH MFG. CO., INC., 57 GARDEN ST., HOBOKEN, N. J.

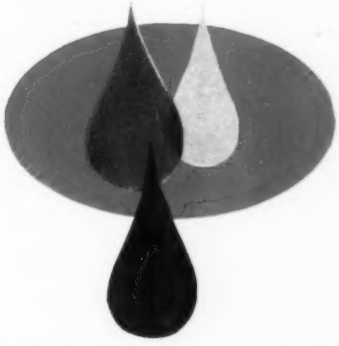
New Fluorescent Lamp Ballasts

587 Fluorescent lamps, unlike incandescent lamps, are highly complex, and cannot be connected directly to the line. Unless the electric current is stabilized, more and more current would rush through the lamp until it becomes inoperative. The stabilizer is called a ballast. With more and more fluorescent street lighting installations, the ballast, which wears out before the fixture, has become an important replacement part. For a 14-page booklet on facts, methods and equipment, write ADVANCE TRANSFORMER CO., 2950 N. WESTERN AVE., CHICAGO 18, ILL.

(See page 70 for more Bulletins)

ARE YOU SACRIFICING

POTENTIAL PUMPABILITY



Of course you are not willing to write off the substantial costs of a water well because of excessive drawdown! In many cases a decrease in production can not only be halted . . . it can often be reversed and returned to near the initial rate . . . by servicing or treating problem wells with advanced Halliburton Water Well Service Equipment and Techniques.

Your Halliburton Representative can show you how to improve your well's productivity by helping you select a proper service for a specific problem. Halliburton equipment and experienced personnel are available throughout the country – day or night – to provide you with services such as . . .

* **CEMENTING**
* **FORMATION TESTING**
* **ACIDIZING**
* **FORMATION FRACTURING**
* **HYDRO-SONIC REDEVELOPMENT**
* **SPECIAL TOOLS**

Contact your nearest Halliburton Representative for full details.

HALLIBURTON

WATER WELL SERVICES

HALLIBURTON OIL WELL CEMENTING COMPANY • DUNCAN, OKLAHOMA

but only the Westinghouse Lamp has six

Despite similar appearance and ratings, these fluorescent lamps are *not* the same. One is a better lamp—and a better buy—because it's the only fluorescent lamp with all 6 advances described below. That lamp is made by Westinghouse. It costs you no more than any other leading brand—but it will give you years of trouble-free, efficient lighting.

1. **MORE EFFICIENT PHOSPHORS**—A special Westinghouse process selects Ultralume™ phosphor particles of a size proven to give more efficient lighting.

2. **BRIGHTER END TO END**—Lead wires are plated with super-hard Chrome Vanadium to make sure Westinghouse tubes *stay* bright, end to end.

3. **BUILT-IN "SHOCK ABSORBERS"**—Specially designed Westinghouse anodes act as buffers to cushion the terrific shock of electron bombardment and improve lamp life.

4. **"RAINCOATS" FOR RELIABLE STARTING**—Silicone "raincoats"

important advances that make it a better buy!

disperse moisture which can collect on exterior surfaces and prevent lamps from starting.

5. **MIXED GASES**—Westinghouse uses a precise mixture of certain rare gases, under exact pressure, to improve the light output.

6. **TRIPLE-COILED ELECTRODES**—To protect electrodes from the sudden electron bombardment when the lamp is first turned on. Emission material is quickly heated, fully protected.

Regardless of the type or wattage of fluorescent lamps you buy, you will get better value, more light for your money, and longer, trouble-free service if you specify and insist on Westinghouse fluorescent lamps. Westinghouse makes a complete line, from tiny 4-watt lamps for instrument lighting to the giant 96-inch Super-Hi™ Lamps for store, street, and factory lighting. Contact your authorized Westinghouse lamp agent or nearest Westinghouse sales office.

YOU CAN BE SURE... IF IT'S Westinghouse

WESTINGHOUSE LAMP DIVISION, Westinghouse Electric Corporation, Bloomfield, N. J.

Full visibility from A-W Model 60 lets operator see what he's sweeping . . . where he's going.

Belmont, Calif. reports—

A-W sweeps 6 years—no repairs!

"Six years of repair-free service from a 2-yd. Austin-Western sweeper made the larger A-W Model 60 a logical choice when we needed a machine with greater capacity. We're well pleased with our choice!" states George Spanne, Supt. of Streets, Belmont, Calif.

Low maintenance requirements

Simplified design and quality of construction of Austin-Western sweepers result in long years of dependable, trouble-free sweeping service.

Austin-Western's rear broom and automotive-type steering provide maximum safety, maneuverability and sweeping efficiency. The operator sits up front where he has an unrestricted view of the street ahead of the gutter broom. A-W's maneuver closer to curbs and corners, around parked cars and other obstacles for a 100% clean sweep—sweeping efficiency is increased.

Two A-W sweepers are available—Model 60, 4-plus yd.; Model 40, 2 yd. Both feature rear dumping action, automatic flushing system, single or dual gutter brooms, and a sectional spray bar to put water where it's needed.

Economical, efficient

Learn how rear-broom A-W sweepers with full visibility can perform an economical and efficient sweeping job for your community. Write us today or see your Austin-Western distributor.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

FREE catalogs

Write directly to the address given or use the Post Card on page 55.

Lightweight Fire Hose

588 Most of the 8 pages of *Catalog Section* FH-59 describe and illustrate six different service types of lightweight "Fire-Flex" fire hose; the last succinctly discusses firemen's coats, boots, fibreglass hats and "Rubberhide" safety innersoles. For a copy, write GOODALL RUBBER CO., TRENTON, N. J.

Metal Drainage Structures

589 *Catalog* CMP-5859 describes the various types of factory-fabricated, riveted or locked seam Armco corrugated metal pipe and pipe-arches, explains their advantages, assists in making dimensional and material decisions and recommends general installation procedure. Write ARMCO DRAINAGE & METAL PRODUCTS, INC., MIDDLETOWN, OHIO.

Shovel-Loader Attachment for Cat Motor Graders

590 GraderloadeR has a 1-yard capacity and is built for light and medium loading operations on road and highway maintenance, such as excess windrow loading. It also can be used efficiently for general digging and maintenance operations. For descriptive literature, write MARTIN CO., 620 ANDREWS AVE., KEWANEE, ILL.

Vehicle Fleet Costs Rising?

591 Then you'll want to know how you can reduce the cost of maintaining your municipal car fleet, without reducing the number of cars in your fleet. FLEET SALES DEPT., DEPT. A-2, AMERICAN MOTORS CORP., 14250 PLYMOUTH RD., DETROIT 32, MICH., can give you such information.

Manual Parking Meters

592 These sturdy units are engineered for longer, more profitable service. They are adjustable to any number of hours, have one coin slot, accept coin denominations of 1c to 25c. For full facts, and information on a tamperproof coin collection system, write MI-CO PARKING METERS, P. O. BOX 668-A, COVINGTON, KY.

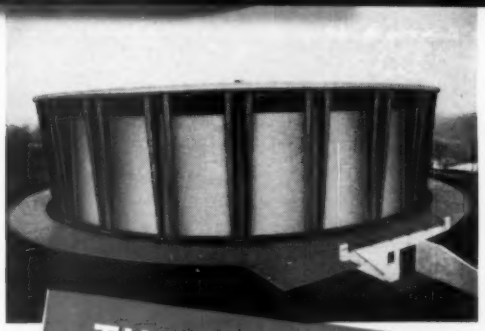
Remote Registry of Water Meters

593 Installation of remote registry equipment for water meters, both residential and industrial, is on the increase. It is convenient, saves time, eliminates wasted calls and call-backs. Facts on a practical, accurate remote recording and totalizing system engineered for minimum upkeep are available from VISI-METER, INC., 301 N. 17th ST., KANSAS CITY 2, KAN.

Matched Outdoor Lighting Equipment

594 The advantages of matched components for outdoor lighting installations are several. They are discussed in a complete line catalog of matched outdoor lighting equipment that includes fixtures for incandescent, mercury or fluorescent lighting, as well as hinged, rigid, separable poles and accessories. Write REVERE ELECTRIC MFG. CO., 7420 LEHIGH AVE., CHICAGO 48, ILL.

(See page 76 for more Bulletins)



A striking example of fine appearance and exacting craftsmanship is this PDM Steel Reservoir built for the Municipal Authority of the Borough of West View, Pa., in a high-value residential district. An entire hilltop was removed to make room for the 5,000,000 gallon structure, special architectural detailing employed for visual appeal, and a two-tone blue color scheme applied to complete a most unusual and applauded neighborhood feature. • Do you have a particular water storage problem? Let us discuss it with you!

THE CONSTRUCTION QUALITY TELLS YOU it's Pittsburgh-Des Moines

5,000,000 Gallon Reservoir, 150 ft diameter by 40 ft high, built for the Municipal Authority of the Borough of West View, Pa. in Ross Twp., Allegheny County. Structure designed by William Murdoch, Consulting Engineer, Pittsburgh, Pa.

PDM STEEL RESERVOIRS

Pittsburgh-Des Moines Steel Company

Plants at PITTSBURGH, WARREN, BRISTOL, PA. • BALTIMORE • BIRMINGHAM • DES MOINES PROVO, UTAH • CASPER, WYO. • SANTA CLARA, FRESNO, STOCKTON, CALIF.

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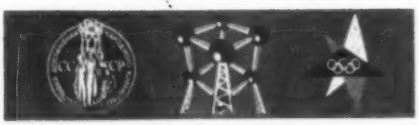
PITTSBURGH (25)	3412 Neville Island	DENVER (2)	323 Railway Exchange Bldg.
BALTIMORE (26)	Curtis Bay Station	DALLAS (1)	Suite 1717, Southland Center
NEW YORK (17)	Suite 2715, 200 E. 42d St.	SEATTLE (1)	Suite 320, 500 Wall St.
NEWARK (2)	744 Broad St.	SANTA CLARA, CALIF.	619 Alviso Road
CHICAGO (3)	616 First National Bank Bldg.	EL MONTE, CALIF.	P. O. Box 2012
ATLANTA (5)	361 E. Paces Ferry Rd., N. E.	FRESNO, CALIF.	346 "G" Street
JACKSONVILLE (7)	4066 Ferrarra Road	STOCKTON, CALIF.	348 N. Harrison St.
DES MOINES (8)	913 Tuttle Street	PROVO, UTAH	P. O. Box 310

IBM RAMAC® 305 SCORED THE WINTER OLYMPICS



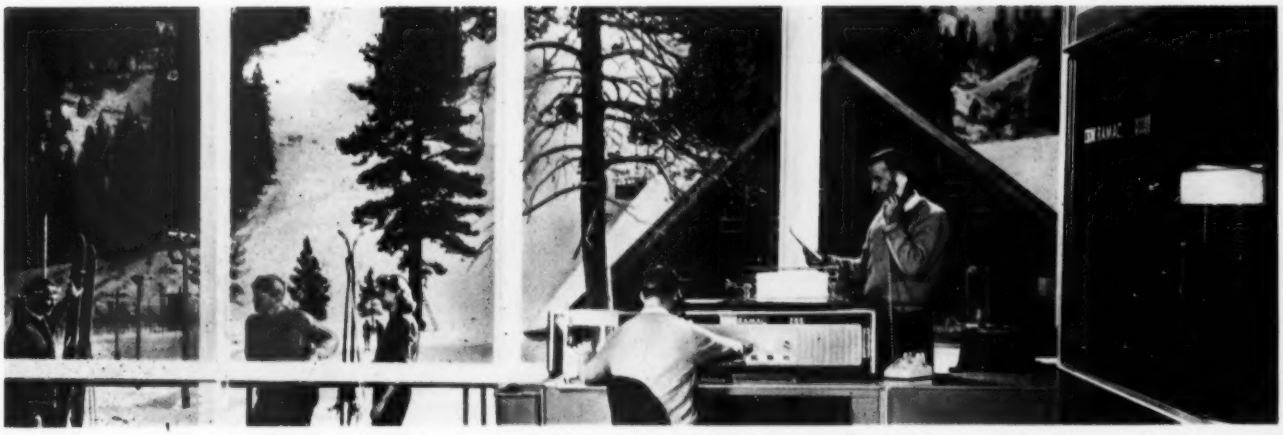
More than 3 million visitors saw the IBM RAMAC 305 *in action at Moscow and Brussels.*

Squaw Valley, California: At the Winter Olympics in February, this IBM Data Processing System gave results of each event almost before the last contestant could catch his breath. Minutes after an event was completed, results were flashed to the judges and information centers.

The key to the speed and versatility of this system is RAMAC's exclusive random access capability. This capability makes it possible to process information in the order received while, at the same time, updating all related records on file.

Throughout the world RAMAC is helping to solve the problems of business with speed and economy. Whether purchased or leased, RAMAC can be profitable to your business, too.

VIII Olympic Winter Games
Commemorative Medal



As each competitor finished his event, word was flashed directly to RAMAC. Here, where almost a million words of Olympic data (in both English and French) were stored on the disk file, RAMAC consulted the rules, computed the scores and printed out a new list of standings as affected by the latest contestant's results. After the event was completed, RAMAC punched out a paper tape for wire services communication. Final results were printed on duplicating masters for prompt press release preparation.

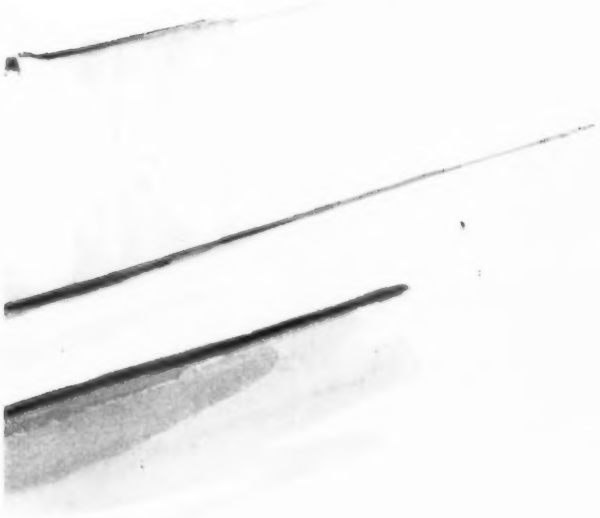
balanced data processing **IBM**

"They wuz a little slow beginnin'... but look at 'em lay Tyton now!"

U.S. cast iron PIPE FOR WATER, SEWERAGE AND

everybody's doin' it

Laying Tyton Joint® pipe, that is. This easy-to-assemble pipe is so foolproof even a bear can get in the act. Only one accessory needed—a simple rubber gasket. No bell holes. No caulking equipment. No nuts or bolts to fiddle with. No weather worries, either. Tyton doesn't mind wet feet . . . can be laid in rain or wet trench. Result: more working days, more lengths laid per man hour, lower installation cost. Sound interesting? It is! Call or write for the facts.



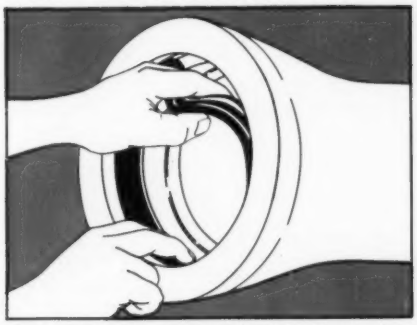
U.S. PIPE AND FOUNDRY COMPANY
General Office: Birmingham 2, Alabama

A Wholly Integrated Producer from Mines and Blast Furnaces to Finished Pipe.

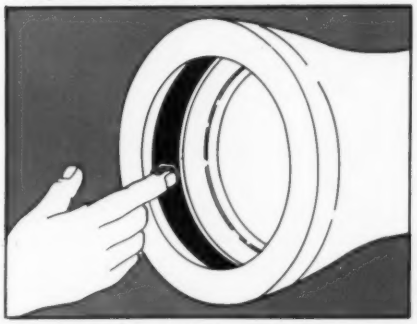
INDUSTRIAL SERVICE CAST IRON®

TYTON®

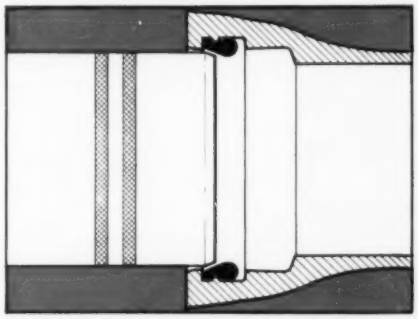
ONLY FOUR SIMPLE ACTIONS



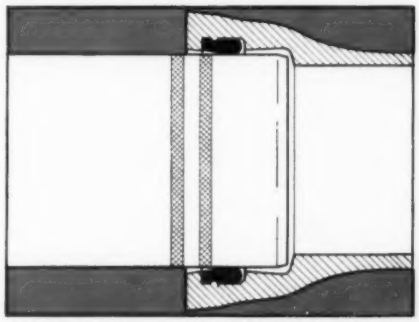
Insert gasket with groove over bead in gasket seat . . . a simple hand operation.



Wipe film of Tyton Joint® lubricant over inside of gasket. Your receiving pipe is ready.



Insert plain end of entering pipe until it touches gasket. Note two painted stripes on end.



Push entering pipe until the first painted stripe disappears and the second stripe is approximately flush with bell face. The joint is sealed . . . bottle-tight, permanently! The job's done . . . . fast, efficiently, economically. Could anything be simpler?

MONEY SAVING *catalogs*

Write directly to the address given or use the Post Card on page 55.

Adapter Kit for Enlarging Traffic Signal Heads

595 Now you can give existing traffic signals added command — quickly and inexpensively. A new 12" signal adapter that comes in an easy-to-install package complete with 150-watt lamp makes this possible. For the facts on KB331 12" adapter kits, write EAGLE SIGNAL CO., MUNICIPAL DIV., DEPT. AC-260, MOLINE, ILL.

Free-Flowing Sewer Lines

596 A simple maintenance expedient that will keep your sewer lines open is described in new literature received from ZEP MANUFACTURING CO., 1310 SEABOARD INDUSTRIAL BLVD., ATLANTA, GA. It is called Zep Sewer Aid and can be used in emergencies to quickly clear sewers of any alkali-soluble obstruction.

Street Name Signs

597 A street system clearly marked with traffic signs that are visible night and day is a sign of good government. Ferro signs are made of permanent porcelain enamel fused on steel and are fully embossed. For descriptive literature and a leaflet on porcelain enamel, write FERRO ENAMELING CO., 1100 FIFTY-SEVENTH AVE., OAKLAND 21, CALIF.

Locates Valve Boxes— Free Trial

598 This improved instrument now locates valve boxes with greater speed and more economically. It operates on magnetic action, is compact, rugged and convenient to use. Illustrated literature gives full facts. For a copy, and to arrange for a 15-day free trial, write AQUA SURVEY & INSTRUMENT CO., 2010 LESLIE AVE., CINCINNATI 12, OHIO.

Snow Removal Equipment

599 One-man operated, low-maintenance tailgate, hopper and pull-type spreaders and reversible or one-way plows designed for fast, low-cost snow removal are described in literature, available from THE FLINK CO., 5509 N. VERMILLION ST., STREATOR, ILL.

Stationary Air Compressors

600 A new 24-page booklet includes specifications on three basic models of the WN-114 stationary air compressor, a semi-radially constructed unit ranging from 1,385 cfm to 1,948 cfm at 125 psi. Components, intercooling, lubrication, motor mountings and accessories are illustrated and explained. Write JOY MFG. CO., HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.

Copper and Brass Pipe Tools

601 These tools have been added to the regular line of power and hand pipe tools manufactured by TOLEDO PIPE THREADING MACHINE CO., 1445 SUMMIT ST., TOLEDO, OHIO. They include cutters, flaring tools, swaging tools, reamers and benders. All are described in literature available from the company.

Complete Line Electric Plant Folder

602 A special brochure has been announced by D. W. ONAN & SONS INC., MINNEAPOLIS 14, MINN. It lists in detail each series of gasoline-driven electric plants (both air and water-cooled), manufactured by the company to provide dependable primary, standby or portable or mobile power. Request *Gasoline Electric Plant* Folder F-145.

For Tractor Users

603 Have you seen the new 16-page color catalog on the Oliver OC-4 tractor? It's filled with application details and data, shows many work-speeding equipment changes. For a copy, write THE OLIVER CORP., DEPT. 2232 400 W. MADISON ST., CHICAGO 6, ILL.

For Better Water and Sewage Treatment

604 Information on specialized equipment for the effective treatment of water and wastes as well as help with plant design, can be obtained from water and waste treatment engineers at CHAIN BELT CO., 4648 W. GREENFIELD AVE., MILWAUKEE 1, WIS.

Reflectors for Highway and Traffic Applications

605 Quad reflectors provide a red warning light for approaching vehicles and a white light to illuminate obstructions in the street or roadway. Each has a molded lens that has a prismatic pattern to reflect light from approaching cars in case of reflector lamp failure. For descriptive literature, write QUADRANGLE MFG. CO., 32 S. PEORIA ST., CHICAGO, ILL.

(See page 78 for more Bulletins)

DAY OR NIGHT!

porce lite street signs—always bright!

Only PORCELITE, an exclusive CAMEO process, provides porcelain enamel signs with easy readability by day or night. Porcelite Street Sign plates combine the lifetime permanence of porcelain and glass... with the extra strength of 18 gauge steel. This—plus 6" wide sign plates with 4" letters provide the nation's most readable and durable signs! Longer lasting! Weatherproof! Fade-proof! Vandal proof design, with all aluminum hardware and rivets, join both faces together. CAMEO's street name signs are also available as non-reflectorized signs with a standard porcelain enamel finish. Color to your choice.

CALIFORNIA METAL ENAMELING COMPANY
6904 East Slauson Ave. Los Angeles 22, California • RAymond 3-6351

COMPARE CAMEO'S 10 year warrantee with those offered by manufacturers of other types of reflectorized street name signs.

COMPARE CAMEO'S lowest initial and over-all cost!

3 *styles available*

Write for full details and complete street sign catalog—Today!

USCOLITE PLASTIC PIPE

*Commonwealth of Virginia, Hampton Roads Sanitation District Commission Treatment Plant at Foot of 44th St., Norfolk, Va.

Uscolite pipe solves an external corrosion problem for sanitation district

The Uscolite® pipe line installed in this treatment plant* carries 150 gallons a minute of a saturated chlorine water solution (actually treated sewage water) from the chlorinator to the main sewage line entering the plant.

Prior to installation of Uscolite, pipe severely corroded externally due to the chemical content of the soil and electrolytic action. *Uscolite has eliminated the costly maintenance and constant replacement of pipe.* Uscolite pipe was installed above and below ground because it is rigid enough to resist soil pressure, yet flexible enough to follow earth contours. UscoWeld† Fittings were installed in a fourth the usual time, saving many dollars. The welds are as strong and permanent as the pipe itself. Clamp-type fittings that leak, pull off and impair flow are never needed. *Not one foot of Uscolite Pipe has ever failed in service, when used in accordance with our recommendations.*

USCOLITE ELIMINATES COSTLY PIPE INSTALLATION

Superintendent of this plant says: "The simplest 'big' piping job we ever performed. Four men laid 1000 feet of 6" pipe per day without a sweat."

• • •

When you think of plastic pipe, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial plastic products.

†Patent applied for

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

The New 1960 Asplundh Chippers Are Best for Municipalities

Asplundh Chippers are rugged, absolutely safe, are engineered for continuous, trouble-free service. They chip faster than any other chipper in the world; are easily maintained, simple in design, require less labor and materials cost.

New 1960 features include:

- **new wedge locking bar assembly** for simpler, faster blade maintenance
- **replaceable floor plate,** eliminates need for housing disassembly
- **larger diameter cylinder journals** for a stronger chipping unit
- **removable cutter bar assembly** to facilitate service
- **optional blower unit** to preclude chute stoppage when chipping large volume of dense or wet foliage

DECIDE WITH THE FACTS . . . write for complete information . . . ask for names of users near you. Best of all, ask for a DEMONSTRATION WITHOUT OBLIGATION. What could be more conclusive?

Write today—

ASPLUNDH
CHIPPER COMPANY
501 York Road, Jenkintown, Pa.
TUrner 7-2500

Proven in service by the world's largest tree company

YOU NEED *These catalogs*

Write directly to the address given or use the Post Card on page 55.

Opens Bell Holes, Spot Excavates

606 Here's a backhoe that produces up to 4 pay-cycles per minute, reaches 16' 11", digs 12' deep, swings 188° uninterrupted and mounts on all popular-make wheel-tractors. Hydraulics on both boom and dipper stick are fully protected. For descriptive literature and specifications on the 88-C, write PARSONS CO., SHAWNEE DEPT., NEWTON, IA.

Small Tandem Rollers

607 *Bulletin* No. 435 fully describes and illustrates the operating and construction features of Galion's 3-5 ton and 4-6 ton tandem rollers. Also described is a pneumatic-tire transport and towing attachments for the smaller roller, retractable towing wheels for the larger, and features of the Roll-O-Matic torque converter drive. Write the GALION IRON WORKS & MFG. CO., GALION, OHIO.

Water Process Equipment

608 Bulletins on an impressive line of water development and treatment equipment—aerators, iron removal filters, filter underdrains and wash troughs, controls for filter and water softening plants, filter piping, chemical feeders, clarifiers, open and ducted type mixers, rotary distributors for trickling filters—can be obtained from GENERAL FILTER CO., BOX 350, 925 2nd ST., AMES, IA.

120-Pound Diaphragm Pump

609 This hard-pumping unit handles just about anything—water, sand, mud, muck, solids. Total heads, including friction, up to 50 feet; suction lift of 28'. A manual throttle control adjusts engine speed for 5,000 gph capacity or handling small seepage flows. For full facts, write HOMELITE, A DIVISION OF TEXTRON INC., 103 RIVERDALE AVE., PORT CHESTER, N. Y.

All-New Tractor Shovel

610 Compact, and the smallest "Pay-loader" made with 4-wheel-drive, Model H-30 incorporates the latest improvements and refinements of larger units. Literature points to its husky boom and powerful breakout, 32" dumping reach ahead of front tires, 77½-hp heavy-duty engine, 8' 6" clearance under bucket. For complete data, write THE FRANK G. HOUGH CO., 710 SUNNYSIDE AVE., LIBERTYVILLE, ILL.

Fertilizers for Parks

611 "Urea-form" fertilizers have found ready acceptance on golf courses and in public park systems. They offer the convenience of one seasonal application, are relatively insoluble in cold water and provide a long-lasting and more controlled release of nitrogen than conventional fertilizers. For literature, write HERCULES POWDER CO., WILMINGTON 99, DEL.

Plastic Pipe and Fittings

612 Rigid and flexible plastic pipe and fittings, ½" to 6", are the subject of a complete line catalog, available from CRESCENT PLASTICS, INC., 955 DIAMOND AVE., EVANSVILLE, IND. Types, applications, advantages, installation and handling procedures, a chemical resistance chart and safety factors are included among information given.

RUST-OLEUM®

STOPS RUST!®

and beautifies as it protects in many attractive

COLORS

Distinctive as your own fingerprint. Accept no substitute.

Why let rust mar your park and playground equipment? Rust-Oleum *Stops Rust!* – and beautifies swings, slides, merry-go-rounds, fences, receptacles, buildings, power equipment, etc. Easy to apply by brush or spray, and dries to a firm, decorative coating that resists sun, moisture, heat, fumes, rain, snow, and weathering! Your nearby Rust-Oleum distributor maintains complete Rust-Oleum stocks in all colors for prompt delivery. Clip coupon to your letterhead for complete information and FREE TEST SAMPLE of Rust-Oleum 769 Damp-Proof Red Primer, *today!*

ATTACH COUPON TO YOUR LETTERHEAD FOR FREE TEST SAMPLE

RUST-OLEUM CORPORATION
2651 Oakton Street—Evanston, Illinois

Gentlemen: Please send me a FREE TEST SAMPLE of Rust-Oleum 769 Damp-Proof Red Primer for application over sound rusted surfaces and complete information on the following.

- ☐ New 38-page catalog featuring Rust-Oleum "New Color Horizons" System.
- ☐ 30-page Technical Report on Rust-Oleum fish oil vehicle penetration through rust to bare metal.
- ☐ Nearest source of supply.

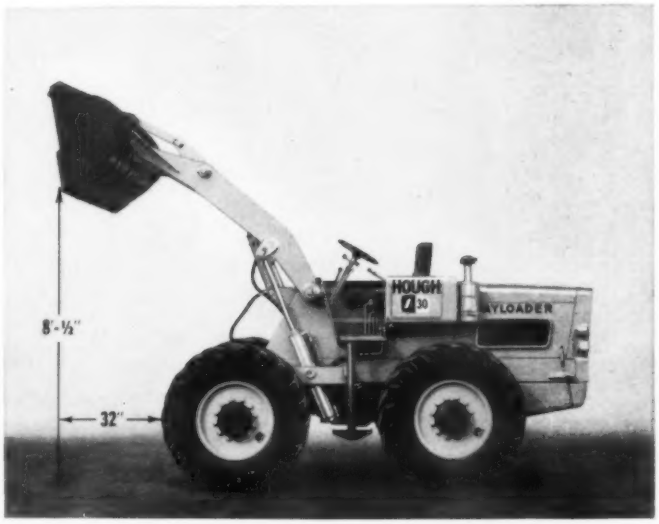
New H-30 PAYLOADER®

COMPLETELY NEW WITH FOUR-WHEEL DRIVE

This all-new tractor-shovel is the smallest "PAYLOADER" ever made with 4-wheel drive. It has an operating capacity of 3,000 lbs. and is available with 1 cu. yd. bucket.

In spite of its compact size and modest price the Model H-30 has the latest improved features and refinements of the larger "PAYLOADER" units and has many performance advantages not found in any other machine.

If you want all the advantages of Hough 4-wheel drive performance and value to fit a tight budget ask your "PAYLOADER" Distributor to show you the Model H-30.



MORE POWER • MORE REACH AND MORE DUMPING HEIGHT

FAR AHEAD
OF ANY MACHINE IN THIS CLASS

Full of exclusive features for better performance

More Power: 77½ hp heavy duty engine provides more power than any comparable machine.

More Dumping Clearance: 8'-½" clearance under bucket edge, dumped — even more than some larger machines.

More Reach: 32" dumping reach ahead of front tires — twice the reach of any comparable machine.

More Reliable Brakes: 4-wheel hydraulic brakes instead of 2-wheel for equal braking forward or reverse. Sealed to keep out dust and dirt. Separate parking brake on drive shaft.

Full Power-shift Transmission plus torque-converter: Provides three speed ranges in each direction. All shifts in either direction can be made "on-the-go" with a flick of the fingers. No need to stop for any "range" shifts.

More Operator Visibility: New slope-down front end styling gives the operator full vision of the bucket digging action without leaning over the side.

More Safety: All boom structures are positioned ahead of and away from the operator. Standard ladder with hand rails makes it easy and safe for the operator to get on and off.

Closed, Pressure-controlled Hydraulic System: Oil reservoir is closed and pressurized to exclude dirt and dust — includes built-in cartridge type oil filter and a fine mesh strainer.

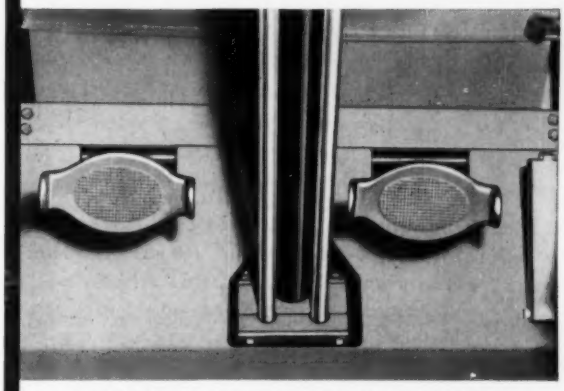
Positive Oil Cooling: Separate fan-cooled oil-to-air radiator assures positive cooling of the transmission and torque-converter oil.

More Accessibility: Compartment on left side with quick-opening cover provides easy access to the battery and all instrument connections. Fuel tank and transmission can be checked and filled from ground level.

Steering-axle Drive Disconnect: A lever in the cab enables the driver to disconnect the rear (steering) axle-drive for over-the-road travel or whenever 4-wheel drive is not needed.

HUSKY BOOM AND POWERFUL BREAKOUT

Boom arms of Man-Ten steel combine exceptional strength with light weight. A single long-stroke hydraulic ram with a high-leverage linkage to the bucket develops powerful bucket break-out action for tough digging assignments.



"OPERATOR'S CHOICE" BRAKE CONTROLS

This exclusive "PAYLOADER" service brake control provides the operator with instant choice of braking with the transmission engaged (left pedal) or disengaged (right pedal) without manual effort.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

THE FRANK G. HOUGH CO.
710 Sunnyside Ave., Libertyville, Ill.

Send complete Model H-30 "PAYLOADER" data

Name _____

Title _____

Company _____

Street _____

City _____ State _____

3-B-1

"AT CLEVELAND MOTOR VEHICLE MAINTENANCE DIVISION we save the taxpayers money by protecting against INDUSTRIAL DERMATITIS with

Go-Jo Creme Hand Cleaner"

...says Raymond Washington, Garageman, Motor Vehicle Maintenance Division, City of Cleveland, Ohio.

A department that operates on municipal funds has a responsibility to use the taxpayer's dollar wisely. When Dermatitis strikes, on-the-job efficiency suffers and money is wasted. That's why it's important to encourage good skin hygiene and provide Go-Jo Dispensers throughout the shop. The handy dispensers save time and cut clean-up costs 75%.

PURGES DEEPLY IMBEDDED GREASE AND GRIME!
(Excellent for "on-the-spot" cleaning; works best with water.)

PROTECTS AGAINST INDUSTRIAL DERMATITIS WITH MEDICALLY APPROVED GT-7!
(a powerful antiseptic.)

CONTAINS SOOTHING EMOLLIENTS TO PREVENT SKIN DRYING!
(This guards against "dangerous starting conditions" of Dermatitis.)

For further information, write:

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ROTARY MOW WEEDS LAWNS
SWEEP WALKS, and DRIVES WINTER or SUMMER
MOVE SNOW FAST!
HOW TO CUT COSTS FOR GROUNDS MAINTENANCE WITH GRAVELY

One Tractor Powers 30 Grounds Maintenance Tools!

The versatile 6.6HP Gravely Tractor powers a complete, year-round maintenance system!

You cut costs two ways: (1) You buy only ONE power unit—with a choice of 30 quickly interchangeable Tools; (2) The Gravely does your jobs faster, easier, more economically!

Standardize on Gravely—as many cost-conscious cities have! Gravely gives you more power at the Tool through direct, all-gear Drive. Simple, precise control, low-cost dependable power for year-round work. Tools that do your jobs more efficiently!

FREE CATALOG & CIRCULAR
Find out why and how Gravely does the job best. Write TODAY for "How to Cut Grounds Maintenance Cost" and Gravely Catalog!

GRAVELY TRACTORS, INC.
P.O. BOX 636-C DUNBAR, W. VA.

PERFORMANCE-PROVED SINCE 1922

No spot for a breakdown!

KEEP IT GOING AT ITS BEST...USE ONLY GENUINE HAYWARD REPAIR PARTS!

Hayward Buckets are designed with the most efficient construction features known. And only with *genuine* Hayward replacement parts can you be sure of maintaining that same high quality. Cheaper "bootleg" parts reduce efficiency, raise costs and disrupt schedules.

Anticipate any possible breakdown.
Write today for list of genuine Hayward parts.

THE HAYWARD COMPANY
50 CHURCH ST., DEP'T A, NEW YORK 7, N. Y.
Builders of Better Buckets Since 1888

What Limited Slip Differentials Mean To The Sheriff of Duval County

For emergency vehicles that can't *afford* to be stuck—police and fire department cars, service cars and light utility trucks—you just can't beat the rugged, all-weather dependability of a limited slip differential.

Read this excerpt from a letter received by Dana Corporation from the Sheriff of Duval County, Florida:

". . . our cars patrol the rural area of Duval County as well as the paved roads, and it would be impossible to travel in some of these areas with conventional rear ends. Our patrols are constantly driving in sand and mud, as well as in woods where there are no roads at all—just paths—and we feel that without the limited slip differential this would be impossible.

"We have limited slip differentials on the 1959 Chevrolets in use in our Traffic Department and we are very satisfied with their operation.

"We lease the cars each year, on a competitive basis. Our specifications for the last two years, and for the coming year, have included a limited slip differential."

(*Signed*) Dale Carson, Sheriff
of Duval County, Florida

Make sure the next cars or light trucks you buy are factory-equipped with limited slip differentials, the differentials that shift power instantly to the rear wheel with the greater traction!

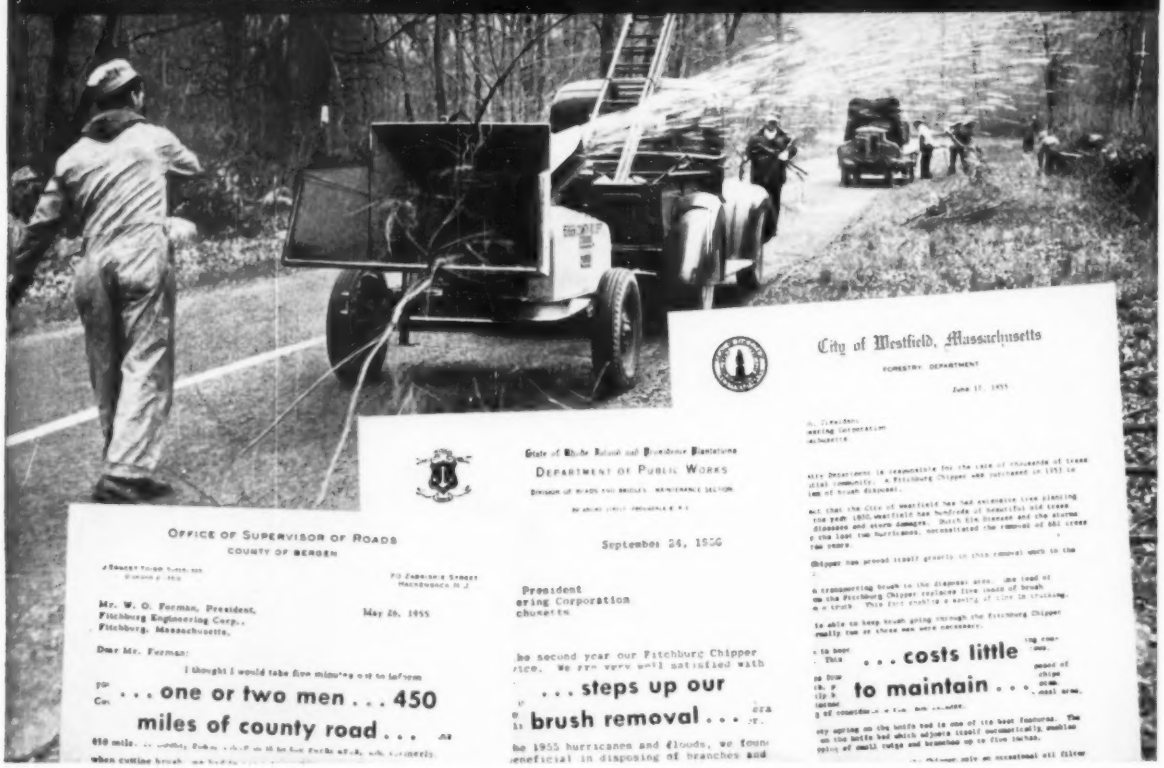
WRITE Dana for free booklet describing the benefits of this positive traction differential—and how it can help you.

DANA Spicer **DANA CORPORATION**
Toledo 1, Ohio

SERVING TRANSPORTATION—Transmissions • Auxiliaries Universal Joints • Clutches • Propeller Shafts • Power Take-Offs Torque Converters • Axles • Powr-Lok Differentials • Gear Boxes • Forgings • Stampings • Frames • Railway Drives

Many of these products are manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario

Is a FITCHBURG CHIPPER your answer to speedy, economical brush removal?


OFFICE OF SUPERVISOR OF ROADS
COUNTY OF BERGEN
Mr. W. O. Forman, President,
Fitchburg Engineering Corp.,
Fitchburg, Massachusetts.
May 26, 1955
Dear Mr. Forman:
. . . one or two men . . . 450
miles of county road . . .
State of Rhode Island and Providence Plantations
DEPARTMENT OF PUBLIC WORKS
September 26, 1956
President
ering Corporation
chusetts
. . . steps up our
brush removal . . .
City of Westfield, Massachusetts
FORESTRY DEPARTMENT
. . . costs little
to maintain . . .

A City, a County, a State have found the Fitchburg Wood Chipper to be their answer to difficult brush removal. These short quotations from out of many testimonial letters show how quickly Fitchburg can solve a difficult municipal expense—brush removal.

City of Westfield, Massachusetts:
"costs little to maintain."

Bergen County, New Jersey:
"one or two men . . . for 450 miles of County Road."

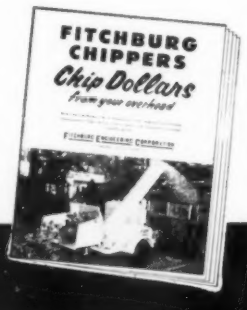
State of Rhode Island:
"steps up our brush removal."

Your City, County, and State, too, can discover these advantages when your maintenance crews use Fitchburg Chippers. Brush crews like the safety of the patented safety spring-activated feed plate—a Fitchburg exclusive—that adjusts itself automatically when brush is fed into the Chipper. They use the disc-clutch that gives Fitchburg a fast stop-start for added safety. Park crews find that Fitchburg's low maintenance, normal lubrication, and tough, chrome steel knives hold their keen edges to keep their chippers working . . . fast!

Look to Fitchburg when you need brush chippers. Check Fitchburg's One Year Guarantee . . . Fitchburg's overall specifications. See the safety features . . . the rugged construction built for long, hard-working service. Your city, county, and state maintenance crews will speed up their brush removal. Make a Fitchburg Wood Chipper your answer to difficult brush removal.

NEW FREE BOOK

"Chip Dollars From Your Overhead." 20 pages. Complete with cutaway color drawings of Fitchburg Chipper in action. Specifications, etc. Write for your copy. Address Dept. AC-63.



FITCHBURG ENGINEERING CORPORATION
FITCHBURG, MASSACHUSETTS

American-Made

CAST IRON PRESSURE PIPE

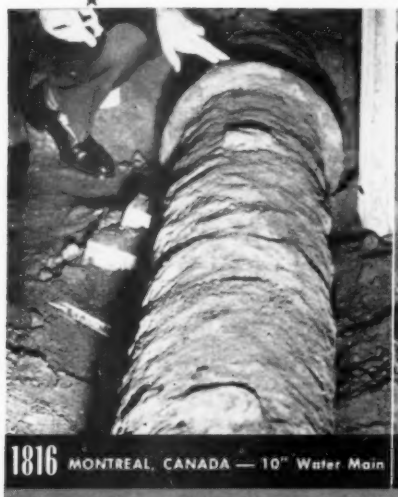
Backed by Strong, Dependable, Responsible Companies

Cast Iron Pressure Pipe produced in America today is backed by responsible companies with long established reputations for quality products ... for proved integrity and dependable supporting service.

These priceless intangibles are added guarantees of the long-lived performance and long term economy of *American-made* Cast Iron Pressure Pipe.

No such guarantees are available to buyers of so-called "bargain" foreign pipe, whether cast iron or cheaper substitutes. If foreign pipe fails, it's the buyer's loss.

–and finally, remember–what America makes, makes America!
Buy pipe that helps create prosperity over here.



1816 MONTREAL, CANADA — 10" Water Main

1828 LYNCHBURG, VA. 7" Water Main

1830 PHILADELPHIA, PA. — 6" Water Main

1834 READING, PA. — 4" Water Main

1831 RICHMOND, VA. 8" Water Main

Early Cast Iron Pressure Pipe, like this, has been in service for a century or more in 68 American cities. Today's American-made Cast Iron Pipe is even better because of improved manufacturing methods, production standards and rigid metallurgical and laboratory controls. You can buy it with confidence in the efficiency of its service and the integrity of its makers.

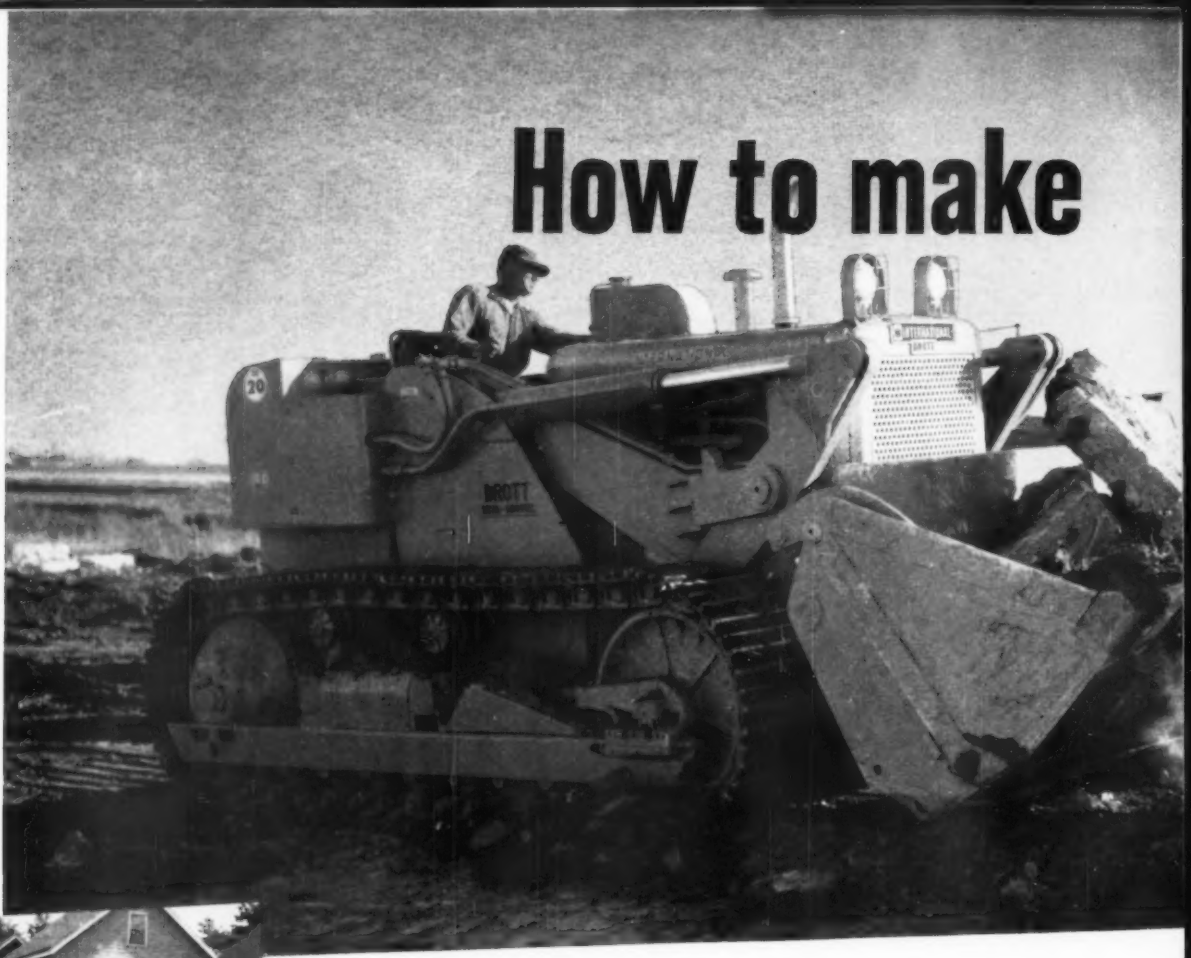
This advertisement is published in the interests of the Cast Iron Pressure Pipe Industry by .....

WOODWARD IRON COMPANY

Since 1882

WOODWARD, ALABAMA

How to make



Let a clam-action 4-in-1

You get a loader that handles sticky materials, even adhesive-like clay—to perform steadily in conditions that stop other rigs "cold!" Exclusive bottom-dumping clam-action is the answer—as this 4-in-1 proves. Opening the clam pulls the material from bucket surfaces—gravity pull does the rest—for positive *self-cleanout* dumping!

You get big bulldozing capacity—to duplicate a full-sized 'dozer blade in work range, production, and accuracy of control. Here, a TD-15 Four-in-One is rolling the earth with its dozer action—to backfill storm sewer trench. Hydraulic "radius control" regulates 4-in-1 dozing depth!

You get a "grader" and "carry-type scraper" in the clam-action 4-in-1—to do rough and finish grading with inch-close accuracy. The 4-in-1 can handle grading, stripping, and spreading jobs which formerly required costly specialized machines and separate operators!

one dollar . . . "double for a dozen"

You get power-shovel-like excavating power from every size of International Drott 4-in-1! All five sizes have famous and exclusive break-out force. See how this 3-cu. yd. TD-20 Four-in-One lifts out reinforced concrete slab, tons at a time—applying up to 43,150 lbs. of break-out power. Exclusive, shock-swallowing Hydro-Spring provides life-prolonging performance protection!

multiply your equipment buying power!

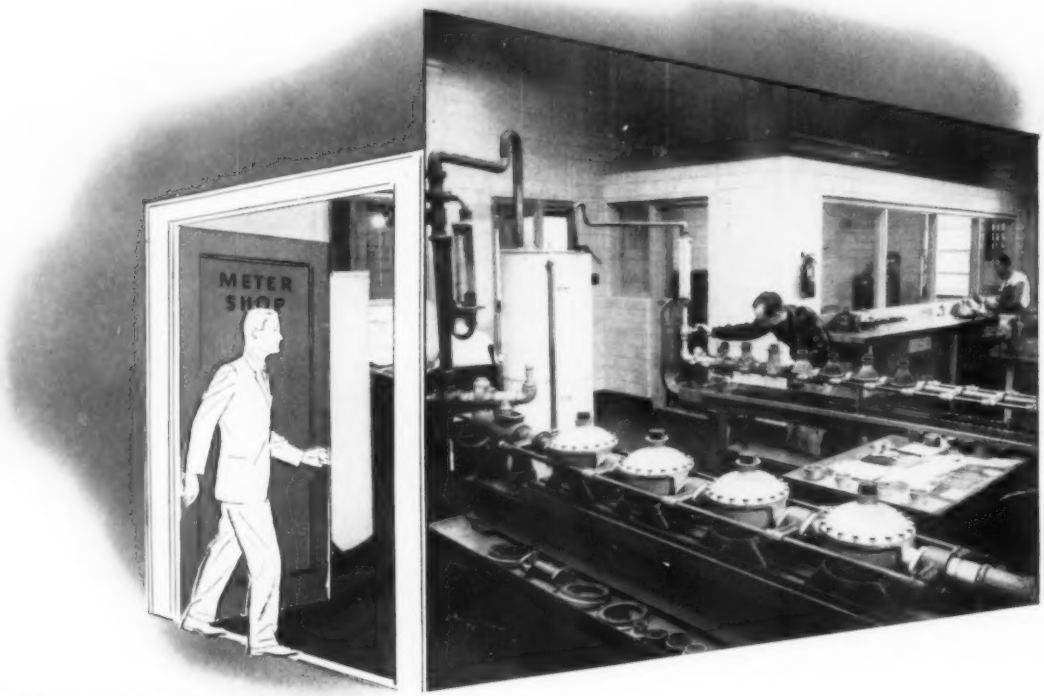
You get sanitary landfill efficiency no other rig can deliver! No other outfit even approaches exclusive clam-action 4-in-1 ability to *spread, level, cover,* and *compact* refuse—and thus give modern, minimum-cost sanitary landfill waste disposal. Note how this TD-15 Four-in-One as "carry-type scraper" is evenly spreading dirt cover over refuse it has spread and "ironed down!"

Put a 4-in-1 "dollar-stretcher" on your community's equipment *buying and operating budget.* Get a whole equipment spread of machine actions for the moderate price of only one 4-in-1—get the machine that does an endless variety of work, all over town. Let your International Drott Distributor demonstrate.

Five sizes: ¾, 1⅛, 1½, 2¼, and 3 cu. yd.!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT



OPEN THIS DOOR

before you open the bids

You learn more about true meter costs when you open the meters for repair than when you open the bids.

A water meter is a fine instrument, and any fine instrument loses accuracy as it wears. Because of this fact, written between the lines of any water meter price are two items of cost you can't read for many years.

First, as a meter loses accuracy, it gives away revenue. Before its first overhaul it may give away twice as much money as it "seems" to save in its low-bid original price.

Secondly, to keep the meter accurate you may have higher repair costs over the years . . . or premature scrap-and-repair programs. Good meters often vary widely in this respect.

Water is your city's most vital service. You entrust it to the accuracy of your meters. Before you buy, walk into your meter shop. Talk to the men whose efforts guard your water supply. Ask which meter gives highest sustained revenue . . . with lowest repair and depreciation costs.

We sincerely believe the answer will be "Trident."

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160

MARCH 1960

The American City

The extremely shallow lot, with the main operating floor set at grade (above), indicated a deep plant, with the rear portion of the plant serving as a sea wall (right).

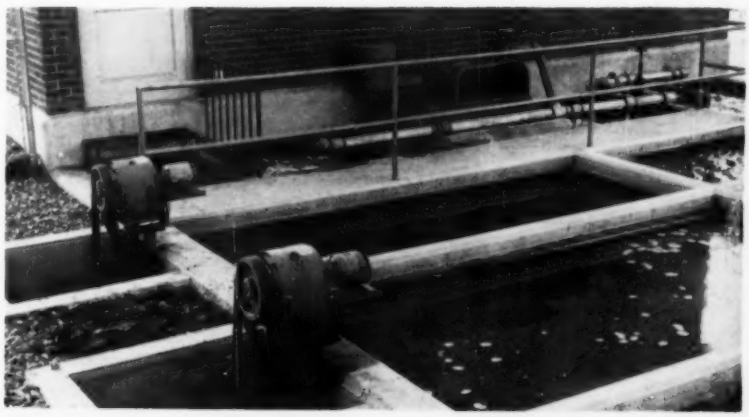
The Wanakah Water Company departs from conventional design principles and gets . . .

Twice the Plant for Half the Money

Vertically - tiered sedimentation basins, mud valves, and the use of high-service pumps as filter rate-of-flow controllers are some of the innovations that have saved money for the Wanakah Water Company, Wanakah, N. Y. Economy was essential, for the owner of this private water utility, in budgeting for his additional requirements of a million gallons daily, set the low figure of only $140,000. After studying the situation, the consulting engineering firm of Thomas M. Riddick & Associates of New York City felt that a new plant could be designed to provide this nominal rated capacity, which could be doubled with contemplated improvements. The new plant utilizes the Riddick firm's plans.

The plant is situated on a narrow lot on the south shore of Lake Erie just a few miles southwest of Buffalo. The lot is so shallow that the north side of the plant has to serve as a sea wall. Since the main floor slab had to be located at existing grade, and foundations carried to rock more than 20 feet below grade, a deep plant was indicated. The design of the sedimentation basin made an advantageous use of this condition.

The four-tiered and hydraulically cleaned flocculation - sedimentation basin is a money and space saver. As shown in the sketch (page 90), the top tier consists of the aeration basin and a three-section flocculation basin. The next three tiers are sedimentation basins. A vertical wall divides these basins into two parallel units. By means of shear gates, the sedimentation portion of the structure may be operated as one large unit or two separate units of equal



Belt and pulley connections between the drives and flocculator paddle shafts permit variation in the speed of the paddles in all three bays.

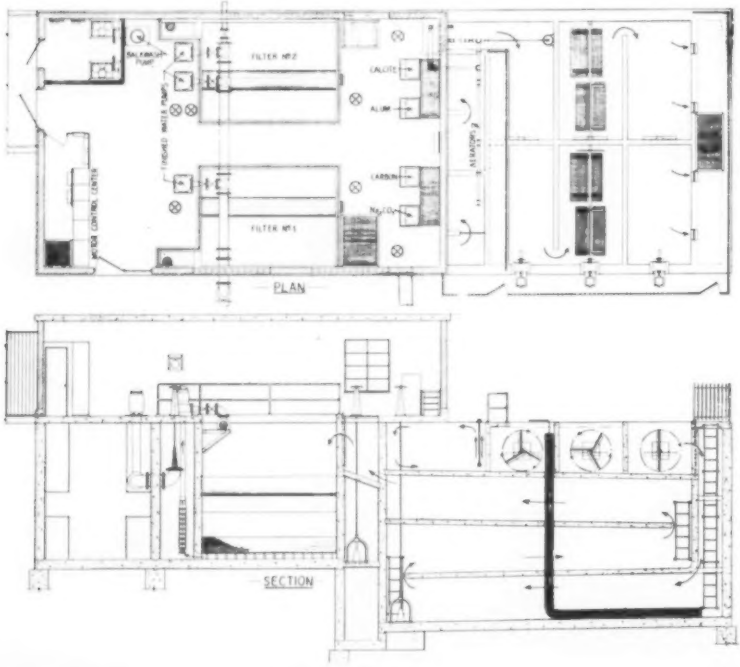
Forced - draft aeration also provides for rapid mixing of chemicals. The observer is looking at the entrance to the flocculation basin.

capacity. The same applies to the two filters, thus half of the plant may be taken out of service without disrupting operations. Further economies were affected by using mud valves instead of regular gate valves to drain the sedimentation basins and raw-water inlet channel. It takes only one minute to open the 24-inch mud valve and less than three minutes to drain the 61,000 gallons of water in each flocculation-sedimentation unit. The resulting high velocities flush out a major portion of the sludge that has settled out in the basin.

An outdoor-mounted Roots-Connersville rotary positive blower discharging through a series of Chicago Pump air-diffuser assemblies provides air for forced-draft aeration and for rapid mixing of chemicals. The Jeffrey flocculation equipment with Falk gear drives consists of three units in series traveling at peripheral speeds of 1.0, 0.8 and 0.6 feet per second, respectively. Belt and pulley connections between the motor drive and paddle shafts permit variation of these speeds if desired.

Considering the established fact that (other conditions being equal) the speed and efficiency of floc formation is a function of the length of the shearing surfaces of the agitator, a screen using ½-inch-diameter wire on 2½-inch centers was substituted for conventional red-wood paddle for the flocculators. This increases the shearing surface tenfold and is working well. The design engineers have applied for a patent covering the employment of wire mesh for flocculators.

Lake Erie water enters the plant through an existing intake located in about six feet of water depth, 350 feet from the shore line. Three existing low-service pumps then boost the raw water to the presettling basins, where gravity flow takes over.



Plan and section view of the Wanakah Water Company's treatment plant.

Raw Water

Upon entering the plant, the raw water passes through a screen to remove floating debris, and receives an application of activated carbon to remove troublesome tastes. It then undergoes five minutes of forced-draft aeration for further taste and odor removal. This is followed by primary chlorination and another five minutes of aeration to remove tastes and odors created by the reaction of chlorine with the organic matter in the raw water.

Alum is then added for coagulation, with silica applied when needed. Calcite may be premixed with alum when the alkalinity is low or added separately to serve as a

weighting agent when alkalinity is relatively high.

The water then flows through the three flocculator bays at the top tier, then downward to the far end of the lowest tier of the three sedimentation basins. Slightly sloped horizontal floor slabs channel the flow through the three-tier basin and into the channel serving as inlet to the two filters. After passage through the filters, water then flows to two small interconnected high-service pump wells, each located adjacent to a filter. Soda ash is added to the finished water for pH adjustment.

For dry chemicals the plant utilizes four Wallace & Tiernan volumetric type feeders. Chlorine may be added to the aeration basins, or to the high-service pump wells by means of two W. & T. chlorinators.

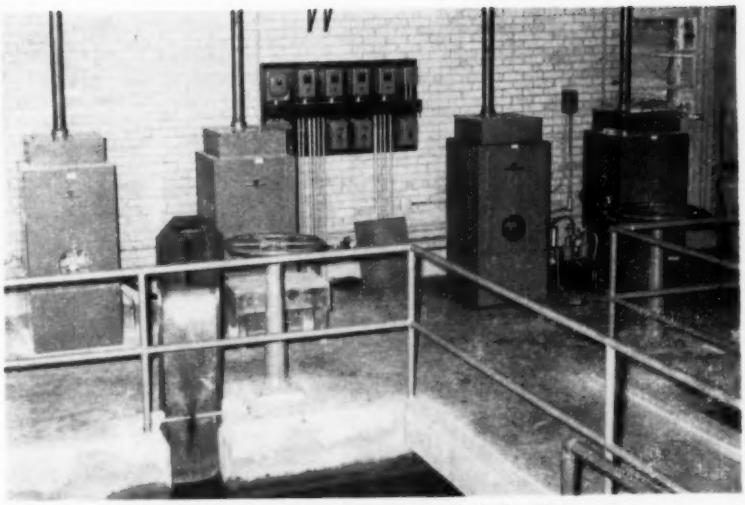
Chemical feed is automatically proportioned according to raw water flow by means of a Builders-Providence Chronoflo transmitter, activated by a Dahl flow tube.

The two filters are each rated at 0.5 mgd at two gallons per square foot per minute. The plant hydraulics permit operation at double this capacity. With one exception, all valves, including filter controls, are manually operated. The exception is a float-controlled butterfly valve on the raw-water influent line, which is regulated according to the water level in the flocculation-sedimentation basins.

Placing the high-service pumps over the pump well adjacent to each filter, and running the pump discharge header over the filters as shown in the plan view (see sketch) has eliminated the need for a pipe gallery, resulting in further savings.

New pumping equipment consists of four Peerless vertical turbine pumps, one for filter back-wash and three for high service. The back-wash unit is rated at 2,470 gpm at 13-foot head and is powered by a 20-hp U. S. motor. The high service units have ratings of 700 gpm, 555 gpm and 387 gpm against a 231-foot head and are driven by 50-hp, 40-hp, and 30-hp U. S. motors, respectively.

The high-service pumps can serve as rate-of-flow controllers by pumping direct from small clear-wells connected to the filters. This makes the static water level in the wells the same as the filters, minus instantaneous head-loss through the filters. When the water level in the pump well drops, due to increased flow to the mains caused by putting a higher-capacity pump in service, the rate of flow through the filters increases. This in turn lowers the water level in the flocculation-sedimentation basins, actuating the float, which controls the butterfly valve on the raw-water influent line. For smooth operation, the raw-water pump capacities coincide in general with the capacities of the high-service units.



The four dry-chemical feeders located at one end of the filter room handle soda ash, activated carbon, alum and calcite.

The high velocity of the water through the sedimentation-basin drain valves and the rapid emptying of the tank flushes out most of the settled sludge.

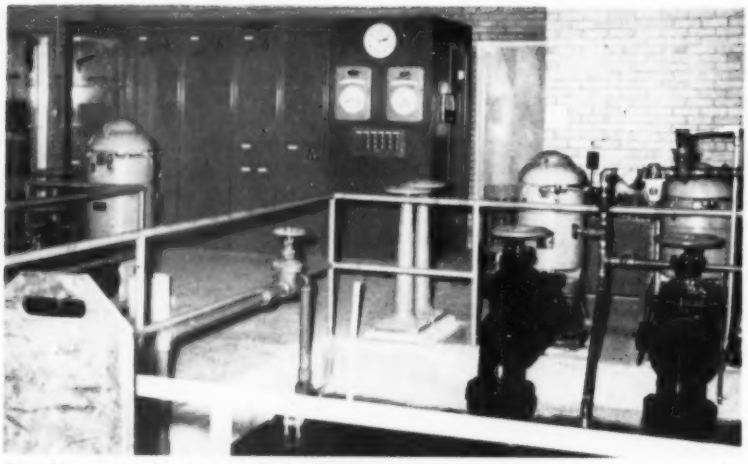
Back-Wash Pump

The back-wash pump is set in a separate 25,000-gallon wash-water storage tank which is located under the filter operating floor adjacent to the filters.

Instrumentation, all Builders-Providence Division of B-I-F Industries equipment, consists of two pump-well depth indicators; an indicator, totalizer, recorder unit for high-service discharge; and a telemetering installation giving water-level data on the 250,000-gallon elevated tank floating on the distribution system. Switchgear is all Square-D Company equipment.

Upon completion of the new facilities, the Wanakah Water Company placed the five old pressure filters on a standby-service basis and converted an existing upflow clarifier to a presettling basin. Consequently all operative treatment units are new.

Since, based on design capacity, the plant cost approximately half as much as one of conventional design, and since it is anticipated that true capacity will be double the nominal rating, the net result gives promise of a water-works at about one-quarter of the conventional cost. Some savings was, of course, effected by use of the existing plant for



The filter room is also the high-service pump room and pipe gallery, with the discharge header above the filter beds. The control panel is in the background.

chemical storage and office space. However, the cost also included the high-service pumps with electrical controls.

To Alfred M. Roberts, president of the company, the newest addition to the plant serves as an important milestone in what might be called a family tradition—furnishing water to the Wanakah area. In 1896 Mr. Roberts' father, the late John T. Roberts, rigged a windmill-powered pump and started selling water to an even dozen customers.

Today the company has eight employees and serves about 2,650 customers, all metered. Facilities include the new plant, about 40 miles of mains and a 250,000-gallon elevated tank erected in 1933. That year the company obtained a $70,000 Reconstruction Finance Corporation loan from the federal government, one of the few such loans obtained by private water companies in the nation.

Lydia King, assistant manager, handles the billing and maintenance of records. The company also maintains its own meter shop at the plant, and although several types of meters are in use, it has standardized on Neptune Trident meters for replacements and additions.

Design Data

Wanakah Water Treatment Plant

***Nominal Capacity*—1.0 mgd**

Sedimentation Basin

- **Surface settling rate—476 gal./sq. ft./day**
- **Ratio—width to length—1:7 for three tiers**
- **Water depth—4.5 feet average**
- **Velocity—0.85 feet per minute**

Filtration Units

- **Filtration rate—2.0 gpm/sq. ft.**
- **Wash-water rate—36 inches per minute vertical rise**
- **Wash-water troughs**
  - **Area—3.17 sq. ft.**
  - **Length—14 feet**
  - **Filter area served—168 sq. ft.**
  - **Unit flow—270 gpm/ft.**

Detention Periods at Design Flow

- **Aeration—8.5 minutes**
- **Rapid mixing—1.5 minutes**
- **Flocculation—25 minutes**
- **(At 20% floc return—20 minutes)**
- **Sedimentation—1 hour 56 minutes**

Water Works' Greatest Need—An Informed Public

Many have pointed out that to make democracy function efficiently, it needs basically an informed electorate. If the nation's water utilities are to operate efficiently and the men in them are to be recognized in their true professional status, then they also must have an informed public.

The American Water Works Association currently has a program spearheading this public - administration drive. Foremost in its support is the Cast Iron Pipe Research Association whose leaders reason that to be effective they must devote their energies to some thing more than pipe sizes and strength.

To the municipal official, CIPRA's most practical aid is a public-information handbook entitled "Water—Make Sure You'll Have Plenty." To date over 5,000 persons from every state have requested copies of this booklet, published to aid in the organization of "citizens' water development committees." It is offered in a series of advertisements in consumer magazines having a total circulation in excess of 22 million. Special magazines such as *U. S. News*, *Nation's Business*, and *World Review* were selected to reach important business leaders.

The booklet explains the water situation, the vital part water plays in community development and growth, and gives step by step guides on how a citizen water improvement committee can organize and carry out an effective campaign to improve water utility facilities. The association also provides civic leaders with a "starter kit," including material for public opinion polls, sample letters, news releases, speech outlines, and window posters.

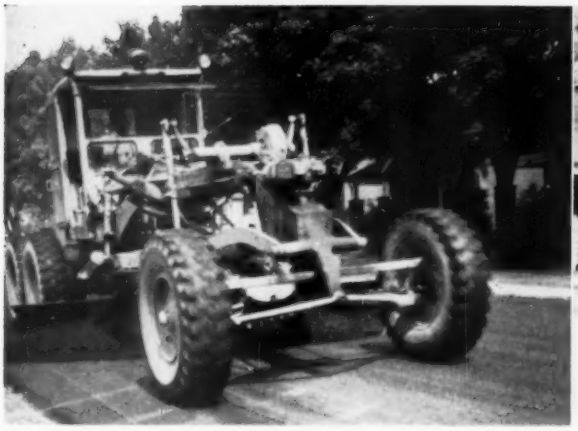
A recent survey taken amongst a random group of those who received the booklet showed that 75% said that they were taking definite action to work with water utility executives to improve their community water treatment and distribution facilities. Thomas Wolfe, managing director of the association, reports that 32% of those queried reported that such committees were now functioning in their communities. More than 40% of the group are members of civic organizations.

Regarding local utilities, 82% of the group stated that they were dissatisfied with some aspect of their community water supply; 75% of those concerned about their present facilities said they were not sufficient for the increasing industrial use of water and more than 66% said the present capacity was inadequate for new housing.

The Association also provides help to the water utility executives by means of a community relations portfolio. It is available through representatives of companies which are members of CIPRA.

The portfolio contains sections on how to work with newspapers, organize citizens' groups, enlist the support of civic organizations, make active supporters of water utility and municipal employees, and use various advertising and promotion techniques. It includes samples of materials suggested for the community relations program and a list of films on water supply problems.

Numerous utility executives have reacted favorably to the portfolio and many have acknowledged its help in carrying out a campaign to finance needed improvements.



A patrol grader blades a second lift of paving material over the compacted first layer. The job is facilitated by the smooth surface of the first course.

The final rolling of the second lift of asphaltic concrete completes the job.

2-Lift Road-Mix Surfacing Stands Up

By J. HOOPER
City Engineer

Peterborough, Canada, after considerable experimentation has adopted a technique of secondary-street resurfacing that officials believe will solve its most difficult street-maintenance problem. A two-lift application of city-designed hot-mix asphaltic concrete—considered a compromise remedy — is standing up satisfactorily, even after two winters of traffic handling.

Severe winters, age and frequent utility openings have punished streets until in many cases they are surfaced with patches (usually cold-mix) held together by patches. Most of these streets have gravel base and varying types of wearing surface. Some have been surface-treated many times and others are old road-mix construction. Most of those in need of resurfacing have no concrete curbs or gutters, and drainage is provided by buried storm sewers, with catch basin openings draining shallow dirt gutters. Many of them, probably because of good granular sub-base, have stood up better than expected under severe weather conditions and growing traffic loads, but eventual raveling and potholing has been the result

The goal is, of course, fully paved streets with hot-mix asphalt pavements, complete with storm sewers, curbs and gutters. But funds are limited and it would be impossible to pave these streets, keep main arteries up to present-day traffic standards and also provide streets for newly-opened subdivisions.

Certain streets therefore were designated for rehabilitation with the compromise method. Considerations weighed were:

1. **Existing surface condition**
2. **Existing and potential traffic**
3. **Evidence of frost and heaving or boiling**
4. **Depth of deterioration**
5. **Convenience of residents**

Priorities were set up on the basis of these considerations. Where deep-down deterioration was noted, or on streets that had a record of frost heaving and boiling, this method was not considered. Higher initial costs of the two-lift method are justified only when costs of repeated patching can be offset.

The Procedure

The road surface is thoroughly swept by a mechanical sweeper, flushed if necessary, and holes not accessible to the machine are thoroughly cleaned by hand. Where the surface is raveled and loose gravel and stone are exposed, these areas are primed with a very light asphalt of good penetration by hand, or if the condition is serious enough, a mechanical spray over the entire wearing surface is necessary.

A hot, plant-mix asphaltic surface course is then bladed on with a Caterpillar motor grader, followed by a ten-ton, three-wheel roller (heavier when available). The depth of the first course is regulated by the amount of material needed to fill holes in the surface, pad up depressions and smooth out irregularities. This course rarely exceeds one inch.

A top course of the material is then bladed on to a depth of 1½ inches to 2 inches. The most satisfactory asphaltic-concrete mixture is:

1) Coarse aggregate (20%) trap rock passing a ⅜-inch screen.

2) Fine aggregate (73.25%) graded bank-sand and trap-rock screenings passing a ¼-inch screen and mixed in equal quantities.

3) Venezuelan asphalt of 60 to 70 penetration at a mixing temperature of 275°F to 300°F comprises the remaining 6.75% of the mix.

The relatively high liquid-asphalt content has been found to increase workability of the mix and the hardness of the resulting asphalt gives a good, hard wearing surface that will not move under weight of traffic and is not tire-marked by the motor grader when spreading.

The resurfacing operation in Peterborough is performed only during good weather and at temperatures above 70°F. The dryest operation gives the tightest bond.

The winter of 1958-59 was a severe one, and streets resurfaced prior to that period have stood up very well.

A specially equipped truck can approach waste containers straight on, or from any angle up to forty-five degrees.

Valdosta Containerizes—Saves 75%

A Georgia city saves almost $20,000 a year in labor costs by containerizing refuse collection in downtown business areas

By **HOMER D. REED**
City Manager

Valdosta, Ga., has—with no special budget appropriation — made striking improvements in the appearance of its business area and succeeded in reducing its commercial waste collection costs by 75%.

A new $45,000 mechanized waste-collection system (the first of its kind of such volume) was installed in August 1959 and already has proved its value. The city at that time purchased 131 LoDal Loda-Matic waste containers and a Dodge truck equipped with a 20-yard Hydro E-Z-Pak garbage body and a special LoDal front-mounted loader.

All units of the equipment are easily maintained and merchants are so enthusiastic that those outside the area now served are urging that containers and containerized service be provided for them also. Results have fostered plans in Valdosta for more than doubling the scope of the system in the near future.

Operation of the system is uncomplicated. Lo-Dal waste containers of 1- to 4-yard capacity are placed at strategic locations throughout the commercial area, where businesses use them as accumulation bins.

Collection

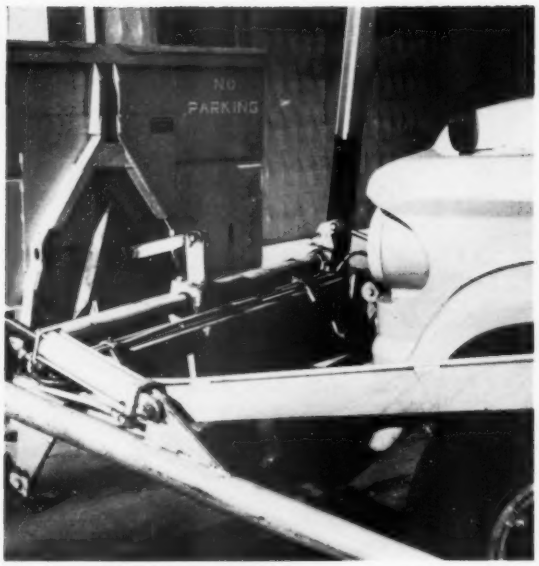
When containers are full, they are emptied by the specially equipped truck. The truckdriver, operating hydraulic controls in the truck cab, engages the front-mounted loader in a triangular channel on the container. The loader then lifts the container, locking it in place and swings it up over the cab to the hopper opening in the top of the compaction body. The inverted container empties into the hopper. The driver then returns the container to its original position and moves on to the next location.

In this manner, approximately 100 yards of loose refuse are loaded into the 20-yard compaction body before it becomes necessary for the truck to make a trip to the disposal site.

A sweep arm attachment on the front loader has been of particular value. With it, the truck approaches parallel to the container or from any angle up to 90°, attaches it with the sweep arm, then swings it around to the lift position for dumping. The arm mechanism returns the container to its original position after the emptying cycle. This feature has definite possibilities for cities desiring to locate the waste containers in narrow alleys. Valdosta uses the sweep arm in about 15 locations that otherwise would be impossible to serve.

Work formerly done by three trucks and nine men is now performed with one truck, a driver and an assistant. This accounts for substantial savings in the cost of labor.

The decision to purchase the equipment was made after the annual budget for the year had been adopted but the system was acquired, without additional appro-



A triangular hitch makes contact with a triangular frame on the side of the container. The point of contact can be anywhere within the frame.

The driver, controlling the loader from inside the cab, lifts the container to lock it into position, then swings it up over the truck cable to the body of the vehicle.

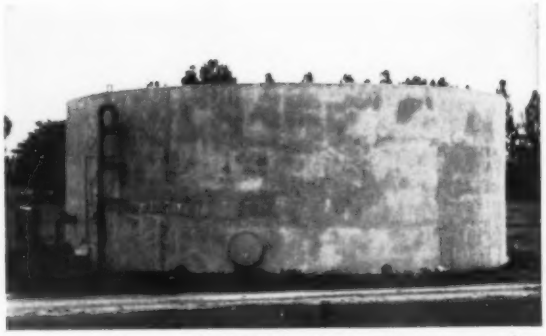
priation, on a lease-purchase basis. All lease payments are being made from actual labor savings. Thus, Valdosta has achieved the planner's dream.

The major new system installation has been made; service to commercial areas has been sharply improved and there has been no increase in the operating budget. At the end of less than three years, the final lease payment will be made and a one-dollar purchase will be exercised. And on that date there will be a sharp decrease in the operating budget.

Few Problems

As in any new installation, there have been a few minor problems. Lids on the larger containers, for example, proved to be cumbersome for daily use by merchants. Their weight made them difficult for women to handle. This is being corrected by a spring-loaded opening lever mounted on the side of the container. This feature will be available on all new installations of the containers.

The container is dumped into a hopper opening in the top of the truck compaction body. A 100 cubic yards of loose material can be packed into this 20-yard body.



The Florida climate allows a coverless digester, outdoor testing facilities and a recirculation-pump installation.

←

Sewage enters the plant through a force main at lower left. The metal tank above the basins is the splitter box for recirculated sewage.

Belle Glade, Fla., Attacks A Difficult

Expensive construction results in phased program starting with portions which can be supported by sewer revenues

By **C. B. TALMADGE***
City Manager

Belle Glade's sewerage problems are probably the most difficult to solve of any in the State of Florida. We now have the answers, as well as a sewage treatment plant designed to serve a population of 10,000 and a sewer system that covers about a quarter of the city area and serves about half of our present population. It will take a little time to complete the job, but recent developments promise to speed this work also.

Muck was our biggest problem, both engineering and financial. The city, located in the rich Glades farming district of southern Florida, is built on the same muck land responsible for the wealth of the area. This shiny black material has characteristics unlike that of any other soils. During extremely dry periods it will ignite much in the manner of low-grade peat. During wet seasons it is almost fluid, having neither vertical nor lateral stability. Within the corporate limits of the city this blanket of muck varies from four feet to as much as 12 feet in thickness. Below this lie alternate layers of rock and muck. The muck under the first layer of rock is of a soupy consistency and is more fluid than solid.

Studies by the engineering firm of Russell & Axon of St. Louis, Mo., in 1946 and 1955 indicated two possible engineering solutions to the problem of stabilizing underground piping. One was the use of piling spaced at about 15-foot intervals supporting properly ballasted and coated corrugated metal pipe. The second method, and the one used, consisted of a firm base provided by excavating all trenches to the first layer of rock and backfilling with crushed limestone to the spring line of the sewer pipe. Under this condition specifications called for the use of vitrified clay pipe with plastisol joints.

As might be expected, the estimated cost of construction in both cases was considerably more than that encountered in areas of more normal soil conditions and it was for this reason work could not get underway following the earlier study.

However, as the city grew, so did the sewerage problem until in 1955 it reached a point where the city officials recognized that some definite action was needed to ward off serious health hazards.

The flat terrain made it necessary to utilize a series of gravity subsystems feeding into pump stations. A minimum required soil cover of 30 inches and a maximum practical depth of excavation of approximately ten feet controlled the size of the area served by each station. Service to the entire city required 16 gravity sub-systems, each serving an area of about 60 acres. Pumping stations were designed on the basis of a 20-year predicted population.

We based our selection of the type of treatment employed on two con-

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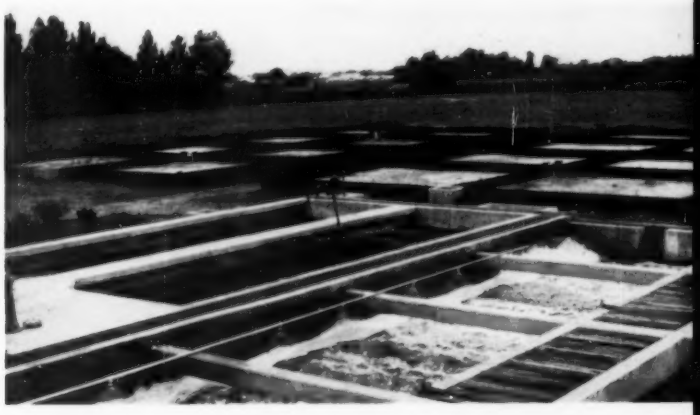
* Mr. Talmadge served as Administrative Assistant to the City Manager of Portsmouth, Va., for two years before assuming the post of City Manager of Belle Glade, Fla., in October of 1958.

This activated-sludge sewage treatment plant represents the solution of many engineering and financial problems for the City of Belle Glade, Florida.



Sprays along the edge of the aeration tanks control foaming. Sludge-drying beds are in the background.

Sewerage Problem

siderations: initial cost of construction and degree of treatment required. At times, static flow in the Palm Beach Canal, the receiving stream, required a very high degree of treatment. Of the two processes considered, activated sludge and trickling filter, activated sludge won out because of its lower initial cost even though operational costs are higher. The plant site is approximately one mile southeast of the city and is adjacent to the canal.

The estimated cost of the entire program amounted to $1,600,000, considerably more than was economically feasible at one step. We overcame this problem by phasing the program, constructing only those portions which could be supported by means of sewer revenues. This included the business section and the migrant workers' quarter. We also reduced the size of the plant from one designed to serve a population of 18,000 to serve only 10,000 people, our anticipated population in ten years. Estimated cost of Phase I came to $750,000. Further help came in the form of a $150,000 grant from the federal government under Public Law 660, bringing our cost down to $600,000. This we obtained through a revenue bond issue having an average interest rate of 4.587%.

Construction bids were taken in September 1958, with the Intercounty Construction Corporation of Fort Lauderdale low bidder on the sewers and the Roemer Construction Company of Belle Glade low bidder on the plant and lift station. Bids were slightly under the engineers' estimate.

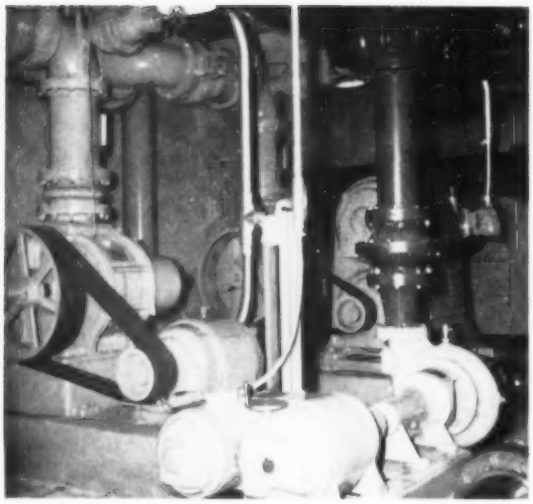
We anticipated considerable difficulty in constructing the sewers. Fortunately, weather conditions were favorable and excavation of the muck proved less difficult than expected, with little shoring required. In some instances it was necessary to excavate below the first layer of rock. In blasting, the contractor exploded the charge before excavating the muck, so that it acted as a blanket minimizing the shock waves, thereby protecting nearby structures.

The water table is very near the surface in the Glades area, making infiltration a major problem. It was for this reason the engineers specified the plastisol pipe joint. The contractor used closed-circuit television throughout in conjunction with infiltration tests, and final tests showed no more infiltration than is usual on a well-constructed system in more favorable areas.

French drains in the bottom of the trenches solved the drainage problem during construction.

Sewers laid included 27,140 feet of eight-inch, 1,700 feet of ten-inch, 745 feet of twelve-inch and 15,059 feet of six-inch vitrified clay pipe with factory-made joints. All six-inch pipe was used for service connections. The force main, all cast iron, included 1,180 feet of eight-inch, 4,325 feet of ten-inch and 4,085 feet of 16-inch pipe.

Construction of the plant also re-



These two blowers provide the air for the activated-sludge process.

A series of plug valves on the recirculation and sludge-line piping permits flexibility of operation with a minimum of effort.

quired the use of piles under all structures and tanks. Piles were driven to an average depth of about 30 feet, and since the muck provides no friction, all were point-bearing supported on the third layer of rock. In one instance a pile penetrated this third layer and disappeared.

A 16-inch cast-iron force main brings all raw sewage to the plant. Flow through the plant, except for recirculation, is by gravity. The two primary sedimentation tanks, equipped with Link-Belt Straightline sludge collectors, are each 50 feet long, 12½ feet wide, and have a 9-foot side-water depth. They provide a surface overflow rate of 800 gallons per square foot per day.

Aeration takes place in two tanks each 75 feet long, 20 feet wide and 9 feet deep. Each tank contains four Chicago Pump swing diffusers. Spray nozzles along the side of the tanks control foaming.

The two final clarifiers are similar in size and equipment to the primary units. Plant effluent flows over a V-notch weir with a Builders-Providence Chronoflo telemeter connected to an indicating, totalizing, recording instrument in the laboratory. We chlorinate the effluent only, utilizing a Wallace & Tiernan 100-pound-per-day-capacity chlorinator.

Two Roots-Connersville rotary positive blowers supply air to the aeration tank. One has a capacity of 1,000 cfm while the other can put out from 400 to 1,000 cfm by means of a U. S. Varidrive motor.

The activated-sludge pumps, both Fairbanks - Morse units, return sludge to either the primary or aeration tanks. One unit, with a 5-hp motor, is rated at 350 gpm at 20-foot head. The second pump has a Sterling Speed-Trol motor and reduction gear permitting a pump discharge variation from 300 gpm down.

For pumping sludge to the digester we have one 110-gpm-capacity Marlow duplex pump located in the basement of the control house. The coverless digester is 58 feet in diameter with a 25-foot sidewall depth. One outdoor mounted Fairbanks-Morse vertical turbine pump provides recirculation at 1150 gpm. Supernatant may be pumped to the drying beds or to the primary tanks. The plant has 16 open sludge-drying beds each 35 feet square.

ACF plug valves on the recirculation and sludge-line piping permit flexibility in operation with minimum effort. The various pumps and motors are operated through General Electric controls.

Testing

The plant also includes a small laboratory. Present tests, conducted by James F. Moon, plant superintendent, include settleable solids, suspended solids, relative stability, dissolved oxygen, chlorine residual and pH.

Phase I included three lift or pump stations, one large station with a structure above grade and two factory-built units installed below grade except for an entrance well. The main station pumps all the collected sewage to the treatment plant. Equipment includes a Chicago Pump Company Barminutor and three Fairbanks-Morse pumps. Two are powered by 20-hp motors with capacities of 1,150 gpm at 45-foot head. The third unit, rated at 2,500 gpm at 50-foot head is connected to a 50-hp motor and also to a Continental gasoline engine through a Johnson Gear & Manufacturing Company right-angle drive.

The two smaller lift stations, both constructed by Schmieg Industries of Detroit, each have two Fairbanks-Morse pumps. Ratings are 500 gpm and 1,000 gpm at 50-foot head for one station and 200 gpm and 600 gpm at 25-foot head at the other station.

Russell & Axon designed the plant and sewer system and supervised construction. Work was done under the administration of Mayor R. W. Lanier and completed under our present mayor, the Honorable Paul Davidson.

Belle Glade has overcome a great many difficulties in getting our sewerage program off to a good start but more work must be done to complete the job. Revenue is one of our great needs and help in this direction came recently with successful negotiations with the State of Florida whereby the city of Belle Glade will receive and treat sewage from the nearby state prison. This will add considerably to the sewer revenue and probably will be instrumental in shortening the time before Phase II is begun.

This National accounting machine has an intercoupler for punching cards.

Seattle Accounts by Data Processing

By **C. G. ERLANDSON**
City Comptroller

The principal accounting operations of the City of Seattle, Wash., cover:

1. Budget Accounting:

a. Record of all revenues. Compared quarterly with the budget estimates in a published report.

b. Record of all disbursements. Compared quarterly with the budget allowance in a published report.

2. Payroll: 8,400 employees paid biweekly (and approximately 3,000 pension warrants issued monthly).

3. Property Tax Collection: The King County Assessor, Mr. Steen, prepares the tax rolls and tax statements. Real estate tax rolls and statements are prepared simultaneously by a combined Addressograph and Burroughs M222 operation. Personal tax rolls and statements are prepared by Remington Rand data processing electronic equipment (Univac).

The King County Treasurer, Mr. Tremper, collects and distributes tax and other monies, utilizing Remington Rand data processing electronic equipment. Tax statements are due and payable on or before April 30 and the second half payment is due on or before October 31.

The City Comptroller allocates to general funds over thirteen (13) million dollars in property taxes collected by King County Treasurer for the City of Seattle. A calculating machine is used in computing the allocations to the participating funds.

The annual budget in the legal form of a resolution is adopted by the City Council by the first Monday in October each year for the succeeding calendar year.

After the budget is adopted in October and before the year end, the City Council passes appropriation ordinances reciting the budget allowances. The City Comptroller's Budget Control Division, before January 1, sets up these appropriations and accounts for the expenditures against them by the numerous authorized spending divisions of the city government. (In 1959, budgeted expenditures will exceed 86 million dollars.)

The appropriation encumbrances and payments are recorded and posted on a National Cash Register accounting machine with an intercoupler which permits IBM cards to be punched at the same time as the visible encumbrance record is posted.

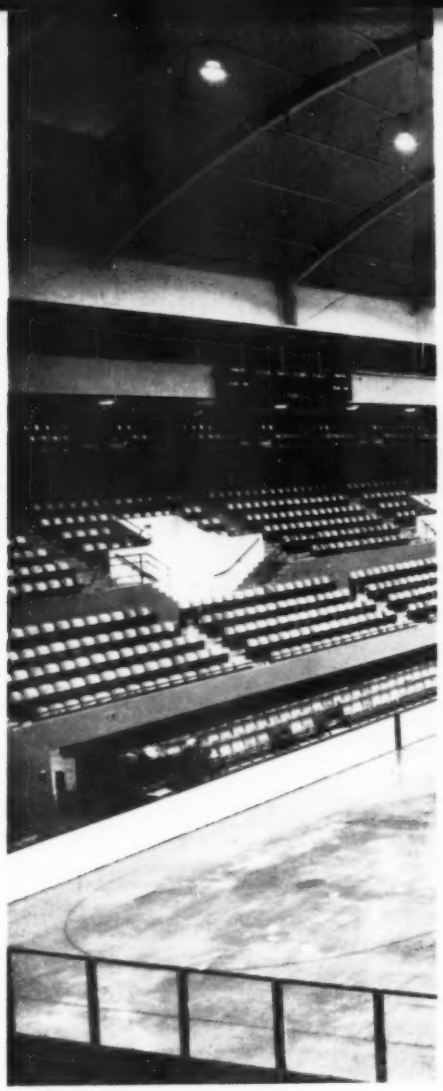
Payroll by data processing began functioning in 1958 after a survey of accounting procedures. During the introductory period and extending to the present, the actual processing is performed by the (IBM) Service Bureau Corporation. The increasing volume and complexity of the city's services and transactions in recent years have required additional accounting attention and records.

Within one year, it is expected, the City Comptroller will take over this complete payroll accounting operation. Changes from the previous payroll are key punched by the comptroller's staff and the cards delivered to the service bureau for processing the current payroll period. The two-week payrolls are run on alternate Fridays; for the 4,400 general service employees one Friday, and for 4,000 City Light and Transit employees the following Friday.

The warrants and five copies of the payroll register are made from punched cards. The copies include a copy for the comptroller's payroll division; a copy for the employees' retirement fund; a copy for the civil service for internal check of authorized employees; a copy for the department; and a work copy for the following pay period on which the department enters changes.

Municipal Ice Skating Rinks

By M. R. OVERBYE
Lewis Refrigeration Co.
Seattle, Wash.



The Spokane Ice Arena.

New equipment, better controls, and better ice arena installations have been paralleled by construction of an increasing number of new large ice arenas for hockey and for public skating.

Because of new technical developments there is no reason why ice arenas should be so limited in number and be available mostly in large population centers. Towns of 2,000 or 3,000 population support bowling alley installations that are several times as costly as a skating rink would be.

An ice arena provides facilities for four types of recreation: curling, hockey, fancy skating, and public skating. A large rink may be used for all four purposes. A smaller rink may accommodate all but hockey.

Planning

An ice rink may also be only one of several facilities provided in a general purpose sport arena. In such case it must be built so the ice sheet can be frozen quickly and removed in a few hours to provide space for another activity.

In planning the rink for your community, you will encounter not only financial but technical problems. You don't have to be a refrigeration engineer to solve these problems. The calculation of the number of tons of refrigeration that will be needed, for instance, is the job of the engineer in charge of installation. Some general technical information, however, may be invaluable to you in determining the basic requirements of such an installation.

The building can be of almost any type suited to the locality and the budget. If a heating plant is required, it should be sufficient to bring the indoor temperature up to about 50 degrees during cold weather. Ventilation must also be provided.

For municipal rinks in large cities, the minimum size should be 85 x 190 feet. This is a good size for public skating and is big enough for hockey. An ideal size for hockey is 85 x 200 feet. If a utility rink only is wanted, the size may be smaller. One curling "pad," for instance requires a sheet of ice 15 feet wide x 150 feet long. A community might start with a two-pad rink 30 x 150 feet in size, and enlarge it as interest in the sport grows. Such a rink could also be used for fancy skating and public skating. For public skating, the usual rule is to allow 30 square feet for each person skating.

The type of refrigeration installation will have much to do with its cost. The installation will be determined by the use to be made of the rink.

A municipal rink in a general purpose arena, for instance, would be installed with the refrigerating pipes imbedded in concrete and it must have a big enough refrigeration plant to build up a sheet of ice in no longer than 24 hours. It must also have provision for melting and removing that ice quickly. Such an installation for a hockey size rink will usually cost at least $100,000 for the refrigeration materials and installation alone.

Where a "permanent" ice sheet may be used throughout the entire skating season, a less costly type of rink may be installed. The piping may be laid on an open or sand filled floor and lighter refrigerating equipment will be entirely practical. This may take as much as two weeks to build up the ice sheet at the beginning of the season.

Using sand fill, plastic pipe, and lighter refrigerating equipment, a utility type rink 80 x 180 feet can be put together with the cost of refrigeration less than $50,000.

Other Factors

Controls. Completely automatic controls are taken for granted in modern rinks. This is no place to cut costs and the best quality thermostat should be used. It should have no more than a two-degree differential and it should be easily adjustable.

Refrigerants. The two possible types of installation are direct-expansion and brine. With the first, the expanding gas itself is used as the ice-forming agent. In the second, the gas (ammonia or Freon) cools the brine which in turn freezes the ice. Although there have been

a number of direct-expansion installations, the brine type is the most satisfactory.

Piping. Diameter of pipe can be ¾-inch to 1¼-inch, the larger rinks using 1-inch and 1¼-inch diameter. For 1¼-inch pipe, this should be placed on 4-inch centers for a general purpose rink. Smaller pipe should be placed proportionately closer. The floor piping used in the Spokane Coliseum is Byers wrought iron pipe.

Headers. The most reliable, trouble-free method of brine distribution is the use of feed and return headers. These are concrete trenches running lengthwise on either side of the rink. This type of installation eliminates innumerable threaded connections, valves, tees, and elbows. Header trenches should be built for easy access for inspection and painting of the piping in the trench.

Ice maintenance equipment. Provision should be made in your budget for ice shovels for scraping the snow off the ice, and ice sprinklers for spraying the ice with hot water to restore the surface. Another invaluable piece of rink equipment is the ice planer. Conditions can develop which cause a variation of several inches in thickness in parts of the ice sheet. This causes lack of uniform ice surface conditions and excessive load on the equipment. For curling, an item known as a "pebbler" is desirable to maintain the curling surface in a proper condition.

Ice thickness. For general purposes, the installation should be planned to provide an ice sheet at least 1½ inches thick. Proper maintenance should assure that it does not get appreciably thicker than that. As it gets thicker, more refrigeration is needed to keep the surface at the desired temperature.

Ice temperature. Hocky players and curlers prefer hard ice, which is the coldest. Fancy skaters prefer dry ice and public skaters favor damp ice, which is the warmest. There is usually only three or four degrees difference between the extremes. The installation should make it possible to adjust the ice temperature quickly and easily for use.

Lighting and interior finish. Nothing will antagonize your potential customers, the sports participants, like a dark and poorly lighted arena, but good lighting makes a rink popular. Walls should be finished in a light color that reflects light well. Ceilings should be flat white. Enough lighting should be installed so that there is even, shadow-less illumination on the surface of the ice. This is especially important in a sport such as curling, where the player must aim his stone at the target indicated by his "skip" nearly 150 feet away.

Estes Park, Colo., constructs a new water treatment plant and improves an existing facility to provide . . .

Good Water for Vacationers

All facilities of the Fall River plant are housed in this single building.

By **R. G. CRABTREE*** Consulting Engineer

Estes Park serves as the gateway to Rocky Mountain National Park. As such it must provide the necessary services to thousands of people who come to the area each year, and one of the more basic services is water. Although the town has a permanent population of only 2,500, no less than 30,000 people are in the area at all times from June through August.

Realizing that an abundant supply of safe, palatable water is required to maintain the good will of vacationers, the town's officials determined to increase the water supply and improve existing facilities. In 1958 they engaged the consulting engineering firm with which the writer is associated to design a plant to treat water from Fall River and also to study and recommend improvements for the existing plant that treats water from the Colorado-Big Thompson Project of the Bureau of Reclamation.

This system, completed in June 1959, comprises a 1-mgd-capacity treatment plant and a 4.5-mile-long, 12-inch pipeline to connect the plant with the town's distribution network. The Hensel Phelps Construction Company of Greeley, Colo., handled the entire project, which was completed at a cost of $138,000 for the pipeline and $140,000 for the treatment facilities. This work was financed by a general obligation bond issue.

Located near the town's hydroelectric plant at Fall River the entire plant is housed in a single building for year-around operation. Raw water enters the plant via a 6-inch steel line connected to the penstock that carries water from a diversion dam on the river approximately two miles upstream from the power plant. The river is a typical mountain stream and originates no more than ten miles from the treatment plant, at an elevation of more than 11,500 feet.

Raw water enters the plant under a head of 420 feet and is released in an energy-dissipating influent well which also serves as a flash-mixing basin. Alum and lime, measured by Infilco volumetric type feeders, are fed in solution form to the influent well. Water leaving the well flows over a Cipolletti weir and the quantity and rate are recorded and indicated by a Builders-Providence "Chronoflo" receiver.

The pre-treatment structure consists of two sedimentation basins on either side of a central channel that serves as a flocculation basin. A system of baffles provides slow mixing.

At design capacity, the sedimentation basins provide 3⅓ hours' detention at manifold-drawoff elevation, but approximately 50,000 gallons can be stored over the manifold drawoff. This storage over the normal drawoff elevation places the high water operating surface approximately five feet above the filter operating surface. Float-operated valves on the filter influent lines maintain a constant level on the filters and overflow provisions at the end of the flocculation channel and in the filters protect the plant from flooding.

Either basin may be taken out of service for cleaning without making it necessary to shut down the plant.

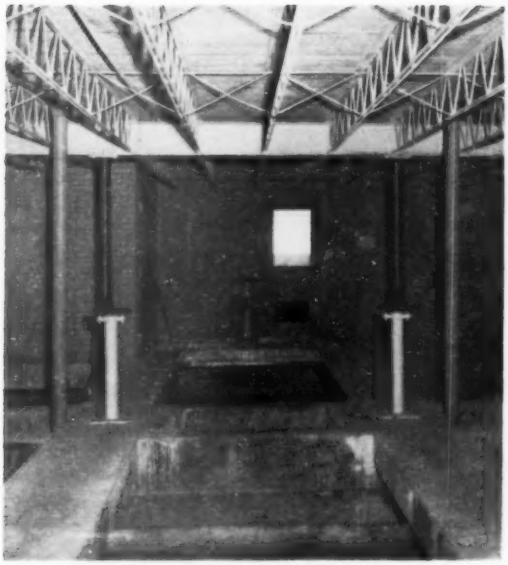
The two filters each have a capacity of 0.5 mgd at a design rate of two gallons per square foot per minute. Filter media consists of 18 inches of graded filter sand over 25 inches of graded gravel. The collection manifold is fabricated from plastic pipe, with chemically welded joints, manufactured by the Colorado Pump & Supply Company of Denver.

Storage Basin

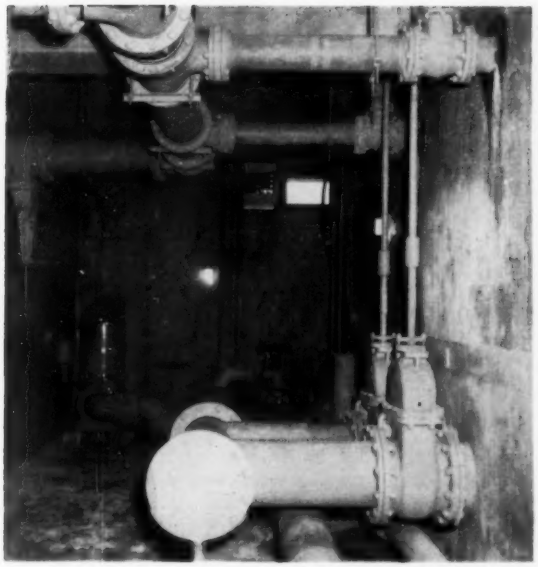
The clear-water storage basin, where the line to the town commences, is located beneath the filters and has a capacity of 45,000 gallons. Flow to town is by gravity. A Builders-Providence semi-automatic vacuum machine adds chlorine, in solution form, to the water as it passes into the clear well.

Providing chemical storage on the

* Mr. Crabtree is Senior Engineer, Designs and Specifications, Municipal Section of Philips-Carter-Osborn, Inc., Engineers of Denver, Colo.



This view of the pre-treatment area shows the flash-mix and the central floc channel.



The pipe gallery provides ample working room. The filter back-wash pump is in the background.

first floor and installing a tube conveyor reduced chemical handling to two simple operations: moving the bagged chemicals from the trucks over a loading dock into the storage room through an exterior door entering only this room; and transporting the chemicals to the feed-machine hoppers via a Hapman tube conveyor. This eliminated the necessity of adding another story to the building.

Filter Washing

A Layne and Bowler Verti-Line pump of 3,500-gpm capacity at 60-foot head provides wash water for backwashing the filters. It takes suction from the clear well. This same pump is cross-connected to the transmission line so that it can be used to increase the capacity of that line should it be required in the future.

Wash water from the filters flows to a decanting pond, is allowed to settle, and is slowly released to Fall River. This is necessary as a state fish hatchery obtains its water immediately below the treatment plant, and settling is required to protect the fish in the rearing ponds.

Two Peerless submersible pumps set in the clear well provide house water for the plant.

The plant contains no automatic or remote control features, and all valves are manually operated by handwheels on floor stands.

The plant is built with structural concrete below the filter operating and pre-treatment operating floors and brick masonry above. Lightweight concrete supported by bar joists makes up the roof. Acoustical tile over the filter operating floor and office laboratory room conceal the bar joists. The entire operating floor, except for chemical storage, is finished with glazed-tile on the walls and quarry tile on the floors. Office and laboratory equipment includes a laboratory table and desk and a modest amount of laboratory equipment to check plant operations.

In 1954 Estes Park contracted with the Bureau of Reclamation to purchase water from the Colorado-Big Thompson Project, taking it from one of the power penstocks supplying the Bureau's Estes Power Plant at Lake Estes. Plant facilities consisted of a covered sedimentation basin, treated-water storage, chemical feed machine for activated carbon, and the necessary chlorinating facilities.

The water, before entering the penstocks, passes through four control and storage reservoirs and a 13-mile tunnel. As the reservoirs aged, algae growth reached a very high concentration until in 1958 the chlorinated water had become unpalatable.

To correct the situation, we added two 0.5-mgd sand filters, increased the detention time of the sedimenta-

This micro-strainer which was installed in the present Big Thompson plant removes 85% of the algae and other microscopic matter.

tion tank by raising the sides, provided for air-mixing of additional chemicals, and installed a Glenfield and Kennedy micro-strainer to remove much of the algae. The micro-strainer has a Mark I screen consisting of a woven stainless-steel fabric with an aperture of 35 microns. It is set in a concrete basin and is separately housed.

This unit removes approximately 85% of the algae, diatoms, and other related microscopic matter from the raw water. The addition of alum and lime produces a floc to remove additional suspended material before filtration.

The chemical machines are Omega dry feed, volumetric units and the air-mix facilities were furnished by Walker Process Equipment, Inc. Criscrete precast concrete slabs, manufactured by Price Brothers, Flexicore Division, Dayton, Ohio, support the filter sand and the gravel.

Filtered water passes to the existing 200,000-gallon treated-water storage reservoir and then to the distribution system. Two Peerless deep-well turbine pumps installed in the reservoir provide wash water for the filters and to clean the micro-strainer. The filter wash-water pump has a capacity of 3,000 gpm at 40-foot head and the micro-strainer pump has a capacity of 60 gpm at 160-foot head.

Except for an electrically operated plant influent valve that closes when the storage reservoir is full and opens when the water level falls to a predetermined elevation, this plant is also manually operated throughout.

F. W. Wolpert of Estes Park constructed the additions and improvements to this plant. The total cost, including the micro-strainer, which was purchased by the town and furnished to the contractor, came to $65,000. This was also financed through the sale of general obligation bonds.

Russel F. Hendrickson represented the engineer on both projects and Superintendent of Water Victor McCracken represented the town. All work was done under the administration of Mayor Clarence Graves and Town Clerk Verne H. Fanton.

All the valves are hand operated. Note that there is glazed tile on the walls and a dropped acoustical ceiling over the operating floor.

Mr. Average Sanitary Engineer

The nation currently has roughly 6,000 sanitary engineers. The U. S. Public Health Service recently surveyed two-thirds of them to determine their professional, educational and personal status. The survey disclosed that:

- **The median age is 44.5 years.**
- **About 56% have the bachelor's degree, and 40% a graduate degree. Four per cent are qualified as engineers through experience rather than a college education. Of those with a graduate degree, 37% have a master's and 3% a doctor's.**
- **About 70% of the 80 respondents holding a doctor's degree, 75% of the 1,052 with a master's degree, and 64% of the 1,385 with only the bachelor's degree were all under 50 years of age. The high proportion of those holding graduate degrees reflects the increasing availability of graduate education in sanitary engineering, especially in the last decade.**
- **Roughly 33% of the engineers engaged in consulting and more than 40% of those in positions of administration or management hold a graduate degree. When grouped by kind of work performed, these two categories represent the oldest in age and those with the most years of professional experience. In view of the relative recency of widely available graduate curricula, these graduate degrees were undoubtedly added to considerable on-the-job experience and thus reflect an engineering competence blended of rising standards and individual initiative.**
- **Approximately the same number of sanitary engineers are in the under-35 and over 55 age groups.**

About 60% of the respondents reported 15 or more years of professional work experience. Another 20% have 8 to 14 years and 17% have four to seven years.

Almost 66% of the respondents identify the fields of water supply, waste treatment, and water pollution control as their primary area of academic specialization or major area of professional experience. On the other hand, only 1% and 0.5% claim major specialization in air pollution and radiological health engineering, respectively.

Half of the surveyed engineers are employed by government, 27% are employed in business or industry, 15% are self-employed, and 5% are in the field of education. The remaining 3% are engaged in miscellaneous activities.

The 50% working in government are apportioned as follows: 15.5% are employed by states, 15.5% by municipalities, 8% by the armed forces, 5.6% by the federal government (civilian), and 5% by county governments.

Fully 33% are engaged in administration or management of some kind. Twenty-seven per cent report being in private practice or otherwise involved in engineering consultation. Sixteen per cent are in development and design work. Sixteen per cent are employed in inspection, production, and sales. Slightly more than 7% are engaged in teaching or research.

The median income of the sanitary engineers (from principal employment) is $8,300.

Only 3,000 of the 4,000 respondents answered the question on additional income from professional service rendered. Of these, about 2,100 (71%) reported receiving no such supplemental income. Of the remaining 29% reporting some added income, 15% received under $1,000, 12% made between $1,000 and $5,000, and 2% more than $5,000.

The complete study, "Sanitary Engineering Manpower" is available from the Public Health Service, Department of Health, Education and Welfare, Washington 25, D. C. A single copy is 25c.

Sparkling in the Desert Sun

Public entrance lobby to the Palm Springs Police Building.

The clean lines, yellow porcelain steel panels of the new Palm Springs, Calif., Police Building, sparkling in the desert sun, symbolize the resort city's civic pride. Wheat-colored concrete block end walls provide a contrast to the black rectangular steel columns.

Architect John Porter Clark of Palm Springs designed the building so that one man, the Watch Commander, could have visual control of public, detention, registration, and communication areas and the front entrance. Long spans of steel permit this uninterrupted view from the centrally-located office which is glazed on all four sides.

In the front of the building are the public lobby, administrative offices, and offices for the detective division. Flexible office space was provided by placing Bethlehem Steel's 12-inch wide flange 27-pound sections 12 feet on center to span 32 feet. Non-bearing partition walls are used for the separation of the various offices.

The cell area was designed for temporary detention. There are two separate cells for women, two for juveniles, one large area for men, a large alcoholic tank, and one fully padded psychiatric cell. There is also one cell fitted with television and individual reading lights for trustee detention.

For front-entrance protection from the desert sun, architect Clark and structural engineer H. C. Whittlesey, designed a system of joists composed of rectangular steel tubes, steel flats, and 1-inch rounds. The joists are 36 inches deep with the rounds welded to the 2-inch by 4-inch steel tubes on the bottom and to a 3-inch by 6-inch steel flat on the top chord.

The canopy leads through a plate-glass buffer wall placed to deflect the strong desert winds. A planter courtyard with bubbling fountains exists behind this buffer glass and provides a refreshingly cool atmosphere in front of the building's public lobby.

The general contract, held by the Press Construction Co. of Palm Springs, was $283,000 and includes the 2,500 square feet in the ten-room detention center, the 78-room administrative section, and the radio communications building. The radio building is a separate structure that contains facilities for radio repair on the city's 15-unit mobile fleet as well as a radio repeater station. Radio signals for the mobile units are beamed from a 100-foot-high steel tower.

Marinette is trying out bituminous curbs in residential districts. Note the trees that have been planted as part of the overall paving program.

Why We Do Our Own Paving

Marinette, Wis., uses city forces to resurface streets; and amortizes its investment over a ten-year period

By **ROBERT J. POSS***
City Engineer

The need for an economical solution to our street maintenance program was felt most strongly in 1955, for in that year we spent more than $50,000 maintaining streets and patching and sealing surfaces. Although much of this cost came about through the division of our combined sewers into a sanitary system and a storm-sewer system, the administration felt it was time to study the entire street problem and come up with a single solution.

Of the 43.5 miles of paved streets in the city, 9 miles of macadam and 2.2 miles of brick pavement were laid before 1913. Much of the macadam was laid over a sub-base consisting of natural soil plus sawdust and slab by-products of the lumber industry that operated in Marinette during the late 1890's. From 1913 to 1932 the city paved 6.5 miles of streets with portland cement concrete and the only maintenance received by these streets consisted of crack filling each year.

From 1932 to 1957 some 25.8 miles of road-mix asphalt were laid. Over the years our streets received only routine maintenance, much of it consisting of patching. After each rain and following the spring thaws the macadam surfaces began to ravel and the streets had to be patched.

Beginning in 1947 we did seal coat the macadam and road-mix asphalt streets with RC-3, RC-5, and stone chips. This reduced the amount of patching necessary, but did not provide a remedy where the base had settled or the surface failed. The sewer program added the final touch to the problem.

Contract Limitations

Our studies showed that the most economical solution would be to resurface the concrete pavements and the macadam surface on a good base with a plant-mix asphalt and to use soil-cement on new construction. Since we had no contractor in the vicinity at the time, asphalt had to be purchased at a plant in Green Bay—some 60 miles away—at an estimated cost of $7.50 a ton "at the belt" plus 4 cents a ton-mile for hauling. In addition we estimated the cost of laying at $2.50 a ton.

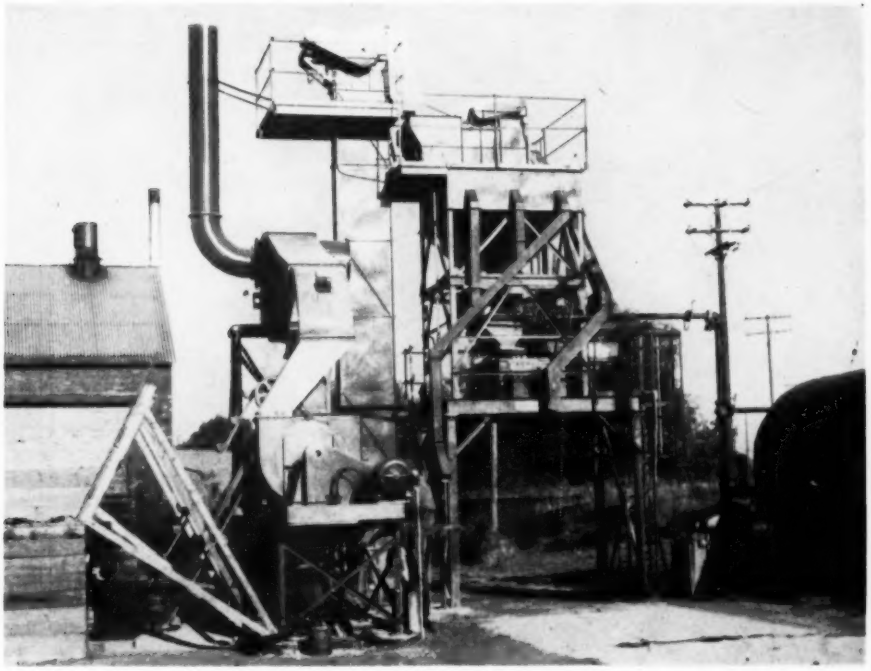
The alternative was to award contracts to fill the needs but this entailed a guarantee of 5,000 tons annually to interest contractors. Moreover, the contractor would expect to lay the entire amount at one time. This latter stipulation made the use of contractors very difficult. We found it almost impossible to coordinate the work schedule so closely.

The next choice was to do our own work with a municipally owned plant and equipment. We could obtain good sand and gravel locally—within a 7- to 9-mile radius—at a stockpile cost of about $1.65 a cubic yard. We also had a good plant site with road and rail facilities. These factors indicated that the city could economically operate its own plant to produce a high-type asphaltic concrete.

We requested bids on both batch and continuous-mix asphalt plants in the 15- to 30-ton-per-hour capacity range. At the letting, we invited representatives of the various makes to explain the details of operation and the advantages of their various machines. This not only helped us select a plant but also provided numerous hints on how we might produce a better asphalt mix.

After a study of bids and information, the city purchased a 20-ton-per-hour Hetherington - Berner batch-type asphalt plant with a tank-car heater which makes use of oil for heat transfer, together with complete thermostatic control. In addition the city purchased a used Barber-Greene paver in good con-

* Mr. Poss has spent the past 20 years in the municipal engineering field and the last 13 years as city engineer of Marinette. He also served with the Corps of Engineers, U. S. Army, on river and harbor duty.



With the aid of this 20-ton-per-hour batch-type asphalt plant, Marinette has begun a permanent street-improvement plan to cut down its maintenance costs.

dition and a used 8-to-10-ton Galion roller. We already owned asphalt storage tanks.

Before going into production we sent samples of the materials to be used to the Wisconsin Highway Commission for analysis and proportioning. The table lists their recommendations. Except for minor changes, we continue to use these proportions. We also send samples of the mix to Chicago Testing Laboratory for stability tests to give added insurance of quality. The Marshall Stability runs about 1,900 pounds on the tests made.

We set up the plant in 1958 and made a short test run to acquaint the personnel with this type of operation. Fortunately, we obtained an experienced foreman for the crew and left the task of training to him.

After the test run, the crew went to work on one of our principal downtown streets. The results of this job convinced city officials.

From August 1 to October 20, 1958, city forces laid approximately 4,000 tons of asphaltic concrete. Production costs averaged $5.02 a ton and laying costs totaled $2.45 a ton. *These costs are accurate.* The Marinette Public Works Department operates on a revolving fund which charges all equipment to the job on which it is used and includes all costs: maintenance, depreciation, insurance, equipment storage and others. The labor account includes fringe benefits such as retirement contributions, social security, health and accident insurance, vacations and paid holidays.

During the 1959 season city forces produced 6,055 tons of asphaltic concrete at an average cost of $4.57 a ton at the plant. Laying costs came to $2.06 a ton—an improvement over the previous year. These costs include $1 a ton for depreciation of equipment reserve. At this rate an annual program of 5,000 tons a year for ten years will completely amortize the first cost. Thus the work is being done more economically—and meets the most rigid specifications.

The typical workday begins about 4 a.m. when a time clock starts the oil-fired heater and begins heating the oil to the proper temperature—300° to 325° F. When the crew arrives at 7:00 a.m. the dryer is fired—and charging of the aggregate hoppers and drying the materials begins.

Meanwhile the laying crew begins checking the materials, making adjustments and preparing the foundation where the material is to be laid. Three trucks and two drivers are used to haul the materials to the job site—one truck being loaded while the other two are delivering the materials.

Details of laying vary. When we place a new surface, the survey

RECOMMENDED MATERIAL PROPORTIONS FOR PLANT-MIX ASPHALT

Base Course:	*Passing*	*Wearing Course:*	*Passing*
Sieve	%	*Sieve*	%
½"	83	¼"-½"	100
		Scalped	
⅜"	70	½"	83
#4	51	#40	24
#10	38	#80	12
#40	19	#200	7.3
#200	5.6	#4	60
Bitumen %—4.6		Bitumen %—4.8	

City personnel, under the guidance of an experienced foreman, turn out a paving job that can meet the most rigid of specifications.

crew first sets the grade stakes. The base, having been previously shaped and stabilized (usually with spent sulfite liquor from nearby paper mills), is then given a prime coat of emulsion. We next place the asphalt mix in two lifts, averaging 1½ inches for the base course and from 1 inch to 1¼ inches for the wearing course.

On new surface work, the surface is primed—and the "wedge" course is laid with a grader, filling the larger depressions. The paver then follows, topping the wedge course with asphaltic concrete.

Last year we experimented with asphaltic-concrete curbs and consider the results only fair. Motorists, especially truck drivers, must be kept off the curbs until the asphalt is solidified. This winter will determine what happens to these curbs during snow-plowing operations.

At an estimated cost of 60 cents a foot, including the 24-inch apron under the curb which is laid with and is actually part of the pavement slab, we feel that we can cut costs for curbing considerably. The crew placed 2880 lineal feet on one street, including driveway and intersection returns, in 7½ hours. For this work the city purchased a Stevens-Canfield curb former. More experimental work will be conducted but we will not lay this type of curb in business or industrial districts.

In connection with our paving program the city also plants trees in the terrace between the walk and the curb. We work with a consultant who selects varieties of trees that will grow in the narrow terrace strip, maintain a neat appearance, and be bushy enough to give shade, but will not grow so high as to interfere with overhead power and telephone lines. Trees planted so far include Norway maple, flowering hawthorne, Idaho locust and little leaf linden. All are doing well to date.

We have had the usual, rather superficial, charges of "socialism" made against our program. The Corporation of Marinette, due to this action, has been able to bring an element of competition into its street-paving work that did not exist before. Moreover, city officials are charged with the task of doing their work at the most favorable price figure. Our experience convinces us that we have done this task.

Plastic Pipe Engineering Properties

Engineering properties, field applications and advantages of thermoplastic pipe in water and sewage work were discussed at a recent Maryland - Delaware Water and Sewage Association meeting in Ocean City, Md. Presenting plastic pipe facts and illustrating the steady increase in the use of plastic materials by water and sewage men, was E. Blomquist, sales manager, Plastic Division, Walworth Co., New York.

Citing development and application of polyvinyl chloride (PVC) in the past decade as probably the most important factor in the trend, Mr. Blomquist pointed out advantages that PVC offers over polyethylene and acrylonitrile-butadinene-styrene (ABS), and other plastics used as pipe material.

He stated that advantages of PVC are high: corrosion resistance, greater tensile strength, better dimensional stability and its excellent weathering properties. Besides, PVC presents low frictional losses, low solids-deposit tendencies, very low electrical and thermal conductivity as well as fire resistance. Labor advantages, Blomquist says, are light weight and ease of installation.

PVC is manufactured in two commercial grades, normal impact and high impact, with the former most often used because of its higher resistance to corrosion.

Limitations inherent with the use of thermoplastic materials also were discussed. The temperature range for satisfactory performance of normal impact PVC is 0° to 150°F, and for high impact grades it is −40° to 150°F. The maximum average pressure recommended for either pipe is 150 psi. The tensile strength of the material decreases with a rise in temperature, so users are always advised to use the extensive data offered in manufacturers' catalogs. These data also include information on corrosion resistance, flow characteristics, support spacing requirements and availability of values and fittings.

PVC pipe in standard sizes from ¼-inch to 12-inch may be purchased now, according to Blomquist. It performs with excellent results in potable water systems, process lines that carry chlorine and fluorine, chemical transmission lines and many other water and sewage applications. He pointed out that plastic pipe has become an accepted part of the piping industry.

Cleaner Air— Without Penalties

Elmira, N. Y., has effected air pollution control with a new, simple ordinance— and cooperation from the press, industry, schools and the taxpayer

Industrial cooperation is exemplified by the Ward LaFrance Truck Corporation which has consolidated its operation into a central plant with enclosed coal storage (left of stack) and enclosed ash storage.

Heavy industrialization causes air-pollution headaches in many cities, and Elmira, N. Y., was no exception. But add Elmira's serious and frequent air inversion to its highly contaminated atmosphere, and you have real double-trouble.

The city is surrounded by hills, forming a natural bowl that earned Elmira the title, "Soaring and Gliding Capital of America," but during periods of inversion industrial gases were trapped in this bowl and became a serious menace to public health. That was ten years ago.

Today, the city is still industrial, and inversions still occur, but saturation of contaminants no longer exists. Air pollution persists but at levels below limits set by the city's ordinance.

The point at which air contamination becomes dangerous never has been firmly established. But Elmira's Air Pollution Control Program was based upon the popular standard of 1 30 of the maximum concentration of dangerous pollutants allowed by the American Council of Government and Industrial Hygienists for industrial workers exposed to these dangers.

As the city's industrial activity increased, there was a corresponding increase in smoke complaints. At first there were isolated calls and requests for municipal action. These grew in volume until groups and entire neighborhoods of Elmira's nearly 50,000 residents were demanding immediate action. The majority of these complaints were made against railroad locomotives.

Finally, in 1948, a Citizens' Smoke Abatement Committee with two co-chairmen was appointed, but it did not result in a fast-moving campaign. There were too many special conditions and not the least of them was the national character of most of Elmira's major industrial plants. The draft of a rigid, hard-hitting air-pollution ordinance, with drastic penalties for violators, could drive these industries out of the city. On the other hand was the clamor of taxpayers, most of whom owed their livelihood to those same industries.

When it was clear that the public and industry could not agree, the Association of Commerce, representing both business and the community, appointed a Joint Smoke Control Committee. Its first act was to consult two separate engineering firms, but both urged the already discarded rigid enforcement of a stiff ordinance that would have

Clean streets, clean buildings and clean air have come to downtown Elmira as residents, industry and schools work together in air pollution control.

During air pollution clinic for custodial and operational personnel, one of the boiler facilities inspected was the plant at Elmira College.

brought prohibitive expense to industry, general business and schools.

At that time, newspapers in nearby Binghamton, N. Y., reported success in air pollution control efforts through adoption of a cooperative plan introduced by the Anthracite Information Bureau of New York City. Impressed with Binghamton's success, Elmira arranged to consult the bureau also.

The committee, with AIB consultants, agreed that a successful program is based on public good will and should develop without causing undue friction or doing injustice to anyone.

The program adopted by the Elmira Air Pollution Committee stressed four principles. The principles were:

1. Create public interest
2. Attain industry cooperation
3. Formulate and execute an education program
4. Seek the cooperation of the newspapers.

The first of these had already been achieved—but in the most damaging sense. The aim, therefore was to repair the damage of past bickering and to present the problem and its possible solution realistically, inviting the public to participate in all phases of the program.

It was stressed that both time and money would be required to correct offending practices. The committee convinced the public that positive, progressive action would be taken and that a reasonable amount of patience and time was needed for corrective action.

The second principle was aimed at securing industrial recognition that the public's right to pure air is as important as its right to pure water. The committee also informed industries that the public was being informed of the time and expense that air pollution control measures would entail. Industry was assured that it would pay to admit infractions and to give evidence of its intention to cooperate.

Results

This portion of the program paid dividends. When expensive or complicated improvement was necessary, industry took pains to explain conditions and tried to predict the date of improvement and/or completion.

The educational program was double-barreled. It provided meetings to inform the public and operational aid for boiler-room personnel through clinics.

At the start of the program, the Anthracite Information Bureau suggested that, since 65% to 70% of combustion smoke is due to careless firing, immediate distribution of free air-pollution literature be undertaken. They also suggested that fuel dealers would gladly assist their customers in smoke abatement. These recommendations were followed and brought about excellent results.

The press in Elmira went beyond mere cooperation. They have been given major credit in the successful program through promotion and through public recognition of air pollution control gains by individual custodians of industrial, commercial and educational buildings. An all-day Firemen's Institute, held in the city's Southside High School, Elmira Free Academy and Parley Coburn School attracted active custodial personnel from a 75-mile radius to attend discussions on proper firing and to observe demonstrations of hand and stoker firing.

The ordinance, which became operative in January 1950, is simple and effective. It varies little from progressive codes in other cities, except that much of the formal legal language has been deleted.

Provision of time extensions for non-complying equipment under special conditions, and provision for a Smoke Control Board and definition of its duties are two important additions to the code.

Before enforcing the ordinance, the board provided a probation period of three to six months for corrective action prior to enforcement and application of penalties. Adoption of the probation period was so effective that, in a decade of operation under the new ordinance, not one court-imposed penalty has been applied.

The secretary-manager of the city's Association of Commerce, credits Thomas J. Rachford, former director of smoke elimination, for much of the city's progress on lowering air pollution.

With long service as chief water tender in the U. S. Navy, Rachford knows boilers and boiler firing and takes pride in assisting operators of offending boilers. He maintained cooperation with all fuel dealers to the mutual benefit of them and the city.

Also given credit for the improvement in the city's control program is the Elmira Board of Education. Realizing early that elimination of smoke means elimination of waste, the schools changed to anthracite coal. The board reports elimination of smoke and soot—and claims real man-hour savings in faster, easier cleaning operations.

Industries and businesses also claim that they are burning less fuel since passage of the ordinance and that they are firing less often and getting better results.

As things now stand in Elmira, the program is not complete, but air pollution has been brought under control—without imposing a single penalty for non-compliance.

Centrally located, easily accessible to existing and future expressways, the glass-enclosed spectator bowl is the only one of its kind in the Pacific Northwest.

New Coliseum for Portland

By **DON JEWELL***
General Manager

Pushing the city's Memorial Coliseum toward a 1960 completion, Portland, Ore., is making an $8,000,000 bid for the title "Convention City of the Northwest." The exposition-recreation center will be the largest multi-purpose structural group of its kind in the expanding region, providing complete facilities for conventions, meetings, sports events, pageants, shows and many other activities.

Located on the banks of the Willamette River and looking across at the heart of downtown Portland, the center will provide an arena building for spectator events, an exhibition hall, facilities for 2,000 parked cars and a plaza. In the arena building, the 246 booths of the exhibition hall will be supplemented by an additional 140 exhibitors' booths on the arena floor and the assembly hall. All booths are figured on a 10x10-foot basis.

The 300-foot-diameter arena, completely enclosed in a 360-foot-square glass-walled building, is the feature of the center. The 120-foot-wide, 248-foot-long, oval-shaped arena floor, with freezing facilities for ice events, is surrounded by a spectacular, reinforced concrete seating bowl that will accommodate 8,500 permanent seats. With portable-riser arena floor seating, the bowl capacity will be over 13,000 for boxing or wrestling matches.

A total of 81,000 square feet of ¼-inch and 3/16-inch Lustragray sheet glass were used in the enclosure. The neutral-gray colored, glare-reducing glass is made by the American - Saint Gobain Corporation, New York.

Two 150-ton water chilling units, made by the Trane Company, supply ice for the rink. The heating and cooling coils and the various fans for the system were also supplied by this company. The circulating pumps were made by the Pacific Pumping Company and the air-supply units were furnished by Pace, Inc.

Architects Skidmore, Owings & Merrill designed unobstructed vision for every seat in the bowl by using four reinforced concrete piers as roof supports, placing them around the periphery of the bowl. The piers, in the shape of a cross in section, are 12 feet outside-to-outside, with each leg of the cross 5 feet wide. Located outside the seat deck structure, they bear three sets of steel trusses, which support steel joists and a steel roof deck with lightweight Zonolite (vermiculite) concrete topping.

When acoustical requirements demand it, or when day-time performances necessitate darkening the arena, a single large curtain that encircles the entire outside circumference of the bowl can be raised mechanically to the suspended ceiling.

The Exhibition Hall is a single-story, reinforced-concrete building. The roof contains a tree-planted plaza and a parking deck with an AASHO, H-10 design loading. Advantage of a sloping site was taken by building the exhibit hall—and covered parking areas flanking it—into the bank, with the roof at grade along one long side. This arrangement and the location of the Memorial Coliseum in the heart of a system of existing and proposed freeways provide convenient entrance and exit ramps. More than 93% of the population of Portland resides within a five-mile radius of the center.

The Coliseum also provides seven meeting rooms of various sizes (seating capacities 120—370) and a large catering kitchen capable of providing food service for groups ranging from small meeting-room banquets to 2,000 persons.

* During seven years as manager of the Pershing Municipal Auditorium in Lincoln, Neb., Mr. Jewell was honored twice by the International Association of Auditorium Managers for outstanding administration. He was appointed to his present post in 1958.

"Parkettes" + Punch Cards = 300% Revenue Gain

Beverly Hills, Calif., redesigns its parking-meter enforcement and collection system—and the resulting benefits surpass all predictions

By **C. RAYMOND WOOD**, Director of Finance and **B. H. RENSHAW III**, Administrative Intern

When Beverly Hills decided to streamline its parking enforcement-and-collection system, benefits to the city surprised even the officials who designed it. The integrated program, the result of cooperative efforts of the Administrative Office, Finance Department and Police Department, started with the hiring of four women ("Parkettes") as parking enforcement officers. Then an International Business Machine card system for tickets and follow-up on violators was installed. Finally, legal collection of parking fees through the director of finance, rather than collection as fines through the municipal court, rounded out the city's greatly improved program.

Evaluation at the end of the first year under the new system disclosed a net revenue of almost $80,000 compared with $19,000 of net revenue under the previous system. Of the nearly $60,000 in additional net revenue, approximately $27,000 is attributed directly to Parkette enforcement, and the rest is the result of a change in the fee structure. The fee for overtime parking was raised from $1.00 to $2.00. Gross receipts prior to subtraction of operating costs amounted to $103,220.

The new system, which took almost four months to devise, is more economical, more efficient and the increased direct parking revenues and collection of delinquent overtime parking fees are far more rigidly controlled. It also has shown significant improvement in public relations.

When recruiting of women parking-enforcement officers was started, applicants represented a wide variety of traits and abilities. The personnel officer looked particularly for characteristics that would make up a cohesive, harmonious group. Enthusiasm, personality and intelligence were stressed for enforcement duties and best performance of public relations and public information functions.

Selection

The personnel office used intelligence tests, marriage counseling tests, general clerical tests (name checking, accuracy and speed with figures), and personality (psychological inventory) tests. Of 21 applicants approved for testing, 11 were accepted for interview by the Civil Service Commission. The director of finance-city clerk then appointed four from the eligible list of seven provided by the commission.

The Parkettes' extensive orientation and training program included:

1. Nature of meter violations,

2. Operation and mechanical components of parking meters,

3. Training in the operation of two 3-wheel, scooter-type patrol vehicles (two West-Coaster models, especially designed for this type of patrolling in conjunction with a "Meter-Maid" program in Portland, Ore.),

4. Orientation by city department heads in functions of each department, a public relations consideration,

5. Meter locations and street plans,

A Beverly Hills "Parkette" tags an overtime parker—and introduces him to a new and improved method of collecting fees from violators.

IBM programming and accounting pave the way to bigger, better returns from overtime-parking violators—and Mr. J. Q. Public approves and cooperates.

both in the classroom and on practice patrols,

6. Meter control methods, traffic safety and maintenance,

7. Orientation in the entire parking program, and

8. Public relations techniques.

To generate enthusiasm, the personnel office encouraged the four successful applicants to participate in many decisions relating to the program. For example, selection of uniforms, and layout of Parkette patrolling routes were influenced by the new officers' suggestions.

Two Parkettes patrol the central business district on foot while the other two patrol outlying areas on the West-Coasters. Each girl spends half a day on foot and the other half on the scooter.

Notices of illegal parking issued by the Parkettes are serially numbered, duplicate standard 80-column IBM cards. They provide space to record the meter location, state of vehicle registration, license number, make of car, date, time of issuance and the meter number. The duplicate copy of this form is left with the violator and the original is turned in at the end of the day.

Payment

A return business reply envelope is supplied to facilitate collection of the fee but payment also can be made over the counter in the finance office. All cash and checks go to the cashier and the duplicate forms that accompany payments are sent to the tabulating division. They are listed, and the list sent to the accounting division for cash control.

Each week, duplicates (that were returned with fee payments) are matched by serial number with the originals in the tabulating division. Unmatched originals represent deliquent fees outstanding.

The unpaid cards go to a card punch where all information shown on each card is punched in appropriate columns. From this deck, a new deck is reproduced, including only the license number and a code assigned to the city by the State Department of Motor Vehicles. This new deck is forwarded to the SDMV, where complete ownership information is put into the cards and they are returned to the city.

Using three new cards prepared from information contained on the original citation and on the returned SDMV deck, a "Notice of Delinquent Overtime Parking Fees" is prepared on the accounting machine and mailed to the violator. The matching process is repeated for this mailing, and after a specific time limit has elapsed, a "Notice of Intention to Issue Warrant" is mailed to violators whose cards still have not been matched by "paid duplicates." The entire file is then turned over to the municipal court for further action, and the original notice card is filed with the paid cards. This file is retained until it is disposed of under the city's record program.

Under the Beverly Hills Municipal Code, the finance department was made responsible for:

1. Detection of parking violations

2. Enforcement of parking-meter use as prescribed

3. Issuance of notices

4. Collection of fees for overtime parking, and

5. Follow-up on delinquent fees.

Prior to the transfer of responsibility, a contractual arrangement allowed the municipal court to deduct 14% of all money collected in fines from revenue returned to the city. With the number of cases requiring action by the municipal court substantially reduced, the court gains valuable time and reduction of operating expense, while the city gains additional revenue.

Many Advantages

The police department has gained full-time use of three policemen who had been sacrificed to duties other than those for which they had been trained.

Public relations were greatly improved. Under the jurisdiction of the finance department—not the police or judiciary departments—local residents look upon Parkettes, not as law officers, but more as service personnel.

Clerical work in the city attorney's office has been materially reduced and the collection system has been greatly improved through the use of the IBM equipment.

Perhaps the greatest significance of the program is recognition by a substantial majority of the city's citizens and its commercial interests that advantages lie in sufficient parking and adequate turnover. Enthusiasm of Beverly Hills' resident public and the technical competence of city personnel involved in the program have provided an entirely new attitude toward parking-meter enforcement throughout the city.

The large-scale operation of Detroit's sewage treatment plant and interceptor system provides service to surrounding communities at less cost than if each community provided equivalent service with its own facilities.

Area-Wide Service Without An Authority

Detroit provides sewage treatment service to the metropolitan district without super-government administration

By **CLYDE L. PALMER***
Assistant City Engineer

Many years ago Detroit acknowledged the principle that effective sewerage sanitation must be approached as an area-wide problem. Subsequent events proved the plan to be of far-reaching benefit to the entire area.

In voluntarily providing the leadership, Detroit embarked on sewage-works construction to serve a contemplated 4,000,000 people. Half of these, according to the forecast, would be within the city limits of Detroit and half in the surrounding communities.

To finance this metropolitan sewerage service, Detroit adopted a rate schedule based on the utility principle of equal charges for equal service. Detroit then stood ready to accept sanitary sewage from any governmental entity in the established service area on a contractual basis.

Detroit's leadership soon paid off. It countered the paternalistic philosophy of the autonomous metropolitan authority with responsibility to no one and emphasized the democratic principle of free decisions jointly agreed upon by neighboring communities without compromising the dignity of independence. Thus the plan recognizes not only the "physical needs" problem, but also the human needs as well.

Metropolitan Service Area

The original planning did not locate definitely where the anticipated 2,000,000 metropolitan Detroiters would live. It did, however, place the plant site at the confluence of the Rouge River with the Detroit River and determined in a general way the area that it could serve economically. The location chosen served the largest area of any studied.

The service area, as indicated on the accompanying map, has a forecast population of 4,000,000, not counting the area of Warren. When Warren decided to build its own plant, the service area was relocated to include other districts equivalent in population.

Under the area-service plan, each of the constituent service areas is free to contract with Detroit or otherwise solve its own problem. If the community decides to join the Detroit system, it still retains full control of the facilities within its own jurisdiction and simply contracts with Detroit for disposal of its sewage.

A very important advantage of the area-service plan is that the Detroit system is a going concern adequately staffed with qualified operators, backed by sound financing and good credit. In electing to use the system, any contracting area is relieved of these problems. Any smaller area operating its own facilities and providing an equivalent degree of service would do so at greater cost than it is now paying for Detroit's services. Table I bears out this fact.

Detroit's system includes:

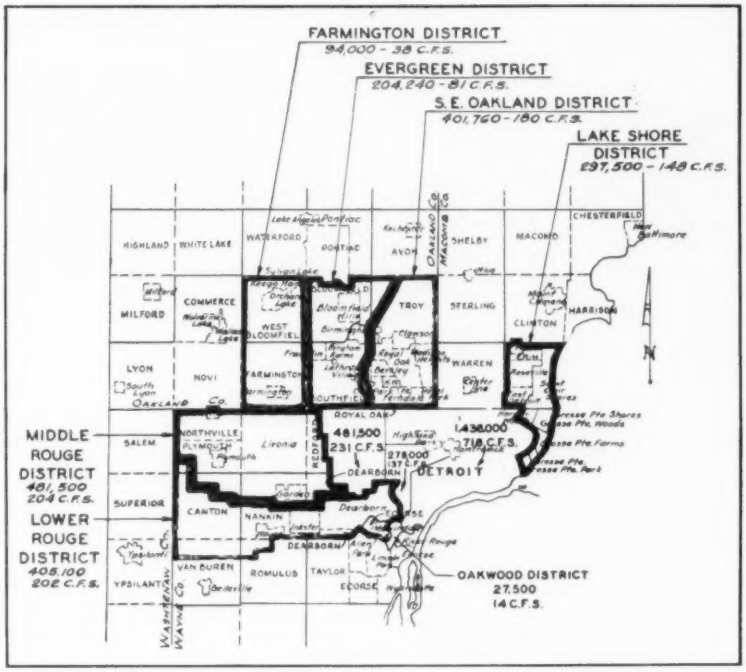
1) The Sewage Treatment Plant
2) The Detroit River interceptor, generally paralleling the Detroit River
3) The Northwest Interceptor, generally following the Rouge River.

The charges that finance this system are based on the cost of construction, maintenance and operation of this system. They include about $100,000 per year for improvements but exclude any profit.

Obviously all political entities in the metropolitan service area do not abut the interceptor system. Moreover, all of the political entities are not even equi-distant from the interceptors.

Consequently, these communities not abutting the interceptor must transport their sanitary sewage to

* Before his appointment as Assistant City Engineer in 1954 Mr. Palmer was Chief of the Sanitary Design Section of the Detroit City Engineer's Office and was in responsible charge of the development of Detroit's $200,000,000 Master Plan for storm-relief sewers now under construction. He has been in municipal engineering since 1926.



the interceptor. It means that they must build connecting sewers.

In providing the connecting sewers Detroit will enter into a contract with any area desiring the service to transport the sewage through the Detroit sewer system to the interceptor system. This service is offered in lieu of the district's constructing the necessary connecting sewer for itself.

Detroit obviously can provide this transportation service more economically than if the district were to construct its own connecting sewer.

Experience shows that water use bears a direct relationship to sewage contributed; thus, charges based on water use are equitable except in unusual cases which can be adjusted on an individual basis The adoption of the water-use basis for determining sewage treatment charges has the further advantage of avoiding duplicate meters and is a much simpler meter-reading and billing procedure.

Sewage treatment charges to contracting governmental agencies are billed as a lump sum based on water delivered to the area, whether it be a master meter or the sum of the individual meters. This leaves the contracting agency free to determine its own basis of passing the charge on to its citizens.

As previously indicated, Detroit will contract with those communities not abutting the interceptor system to transport the communities' sewage through the Detroit sewer system to a point of entry in the interceptor system.

This method of computing the transportation cost is as follows:

• Determine the route traversed by the contracting party's sewage

Table I

COMPARATIVE SEWAGE TREATMENT CHARGES

City & State	Comparative Monthly Charge	City & State	Comparative Monthly Charge
Denver, Colo.	$1.21	Schenectady, N. Y.	$.57
Oak Park, Ill.	.67	Akron, Ohio	.50
Sioux City, Iowa	.25	Cincinnati, Ohio	.60
Ann Arbor, Mich.	.97	Columbus, Ohio	.56
DETROIT, Mich.	.15	Dayton, Ohio	.50
(Suburban Municipal)		Lima, Ohio	.37
Jackson, Mich.	.60	Toledo, Ohio	.24
Lansing, Mich.	1.45	Portland, Ore.	.37
Pontiac, Mich.	.85	Chattanooga, Tenn.	.63
Duluth, Minn.	.47	Beaumont, Tex.	.75
Minneapolis, Minn.	.27	Fort Worth, Tex.	.50
Camden, N. J.	1.13	Madison, Wis.	.90

Note 1. These data are taken from the November 1953 issue of *Public Works Engineer*, published by the American Public Works Association. (Special Report #18).

Note 2. The comparative monthly charges for residential sewage service are based on the following uniform conditions: A 5-room, single family dwelling with a 60-foot lot frontage; one 6" sewer connection; one each of the following plumbing fixtures: toilet, lavatory, bath and sink; and a monthly water use of 665 cubic feet measured through a 5/8" meter.

through the Detroit sewers from point of acceptance to point of discharge into the interceptor.

- **Calculate the original cost of the Detroit sewers along the traversed route and reduce this to the cost per cubic foot per second of capacity. This cost is relatively small because of the large size of the sewers.**
- **Compute the cost to the contracting party by multiplying the capacity required to transport the sewage from the service area by the cost per cubic foot per second of the Detroit sewers traversed.**

In addition, the contracting party must assume the annual maintenance charge on the portion of Detroit sewers it uses. This charge is computed at ½% of the allocated cost of the Detroit sewers used, based on the cost experience of our Sewer Maintenance Division.

Reconciliation of Quantities

To maintain equitable balance among the users of the total system, each service area is required to install a sewage meter which will measure the total amount of sewage delivered into the Detroit system. The meter also provides a check between total water use and total sewage contributed.

Under present policy, when the total sewage flow is within 108% and 92% of the total water use, Detroit bills on the basis of total water use. If the sewage flow exceeds 108%, the difference is added to the billing; if it is less than 92%, the difference is deducted.

The need for this range stems partly from the design decisions establishing a "use factor" of 324 gallons per capita per day on which the capacity of the plant and interceptors are based. This factor contemplated the inclusion of the first flush of storms from combined sewers as sanitary sewage, as a matter of good sanitary practice, and this inclusion can be accomplished within the range of the 108% overage allowance.

The internal organization of Detroit municipal government leads to the legal procedures necessary between the City of Detroit and any other contracting governmental agency. The authority and responsibility over the sewage treatment system is divided between the Department of Water Supply and the Department of Public Works.

The Department of Water Supply has authority over, and is responsible for, the construction, maintenance, and operation of the sewage treatment plant, and is the contracting agency for sewage treatment service. The Department of Public Works has authority over, and is responsible for, the construction, maintenance, and operation of the interceptor system and all parts of the sewage system outside the plant site, and is the contracting agency for transportation service as previously described. In addition, it is responsible for the proper functioning of the interceptor system and, consequently, must determine the allocation of available capacity that can be extended to the several contracting areas.

Thus, it becomes necessary for an area outside of Detroit to have parallel agreements, one with the Department of Water Supply and one with the Department of Public Works.

Design Factors

The necessity of maintaining a balance of flow in the interceptor system is very important if equity in degree of service to all the users of the system is to be protected. This is particularly true in a metropolitan area where there is a multiplicity of individual systems serving different areas, some using the separate system and others using the combined system.

"Balance," as used in this discussion, refers to the amount of service provided per capita. In other words, it is the intention to provide adequate service to all in the same amounts; therefore, in order to extend the service of the Detroit system to a maximum number of people (4,000,000), control must be exercised so that any one area, based on population, will not get an extra amount of service to the detriment of the others.

To accomplish this, contractual agreements with all service areas require the installation of an adequate regulating and metering device at the connection in the Detroit system, which device will operate to limit the service to 324 gallons per capita per day for the forecast ultimate (1980) population. Another facility required of any area connecting into the system is an independent emergency outlet.

Since the advent of the household garbage grinder the original design quantities for solids volume have increased, and those structures and equipment whose capacity is determined by the solids volume of sewage will have to be enlarged or supplemented. With the present primary process, the solids increase due to garbage grinding may be as much as 50% and, with the improved process contemplated, may amount to an 80% increase, depending on the ultimate degree of usage of grinders.

The increase in the liquid phase of sewage resulting from the use of garbage grinders is very small and at most could possibly reach 1%. Thus the structures and equipment whose capacity is determined by the liquid volume of sewage will not have to be expanded.

In the construction of the Detroit system (1936 to 1940), the original installation of equipment had a capacity to serve 2,400,000 people, with space provided in the structures for the balance of the equipment. Also, certain other structures and parts of the interceptor system were designed to allow for the construction of increased capacity as the need developed.

The recently approved sewage-treatment-system expansion program reflects the need to increase the capacity of the plant to handle sewage solids, the need to install the balance of the equipment and structures to bring the system up to the capacity required to serve the originally contemplated population of 4,000,000 people, and finally to improve the treatment process. Expansion of the system, now under way and planned, includes:

Planned and under construction

Table II

DETROIT SEWAGE TREATMENT RATES
Per 1,000 Cubic Feet

Date Effective	City Rate	Suburban Municipality	Suburban Individual
June 19, 1940	11c	21.61c	25c
September 15, 1948	13c	22.5c	26c
January 1, 1959	23c	32.5c	36c

for the period from 1958 to 1961 are plant additions consisting of two sedimentation tanks, enlarged effluent collection channel, an overflow channel, new filter building with ten vacuum filters, and an incinerator building with one furnace. Interceptor additions include a second siphon, extension to one interceptor, regulator and diversion works, control gates and a sanitary pumping station. Estimated cost of this work is $20 million.

From 1961-1965 proposed work includes completion of the second filter building with six more vacuum filters, second incinerator kiln, and interceptor additions, at an estimated cost of $5,767,000.

For the period of 1965-1975 plant additions include three more sedimentation tanks, four vacuum filters, another incinerator and installation of improved treatment process. Interceptor system work includes additional regulation and diversion work on master-plan relief outlets. This is expected to cost $7,027,000 giving a total proposed expenditure of $32,794,000.

The original rate of 21.61 cents per 1,000 cubic feet of water delivered to the mains (28.81 dollars per million gallons) was based on a total capital cost of the system of $27,157,000, of which the City of Detroit contributed $13,740,000 in cash and structures.

Since Detroit citizens contributed $13,740,000 to the cost of the system and continued to assume the operating costs of certain sanitary pumping stations, the rate to them was established at 11 cents per 1,000 cubic feet, which compensated for their contribution. The 11 cent rate to Detroit citizens was the same as the 21.61-cent rate for other users of the system who had not contributed to the cost.

The 21.61-cent rate was in effect from the start of the plant in 1940 until 1948, at which time the rate to Detroit users was increased two cents and the rate to suburban areas was increased one cent to compensate the treatment system for assuming the cost of operating the sanitary sewage pumping stations, heretofore charged to the Department of Public Works.

The next rate change came in 1959 when, in order to finance the $33,000,000 sewage treatment system expansion program, a ten-cent rate increase was approved ($13.33 per million gallons), bringing the rate to suburban municipalities to 32.5 cents per 1,000 cubic feet (43.33 per million gallons). Table II gives the rate structure.

The Detroit area service plan now serves an area outside the corporate limits of Detroit of over 200 square miles. It includes some 48 separate governmental entities, with contract negotiations now under way which will include about 65 additional square miles, including 10 or 12 more governmental units.

It is also to be noted in this connection that one area abutting Detroit, which would normally be included in the service area, and which encompasses 36 square miles and several communities, was recently incorporated into one city. This area elected to build its own sewage treatment system and not use the Detroit system. This shows the working of the basic principle, that the plan should not encroach on any area's authority.

Citizens Take Pride in Big Sewer Job

Business and industrial growth in Jacksonville, Fla., resulted in scores of speedily developed residential areas and a tremendous overload on a once adequate sewer system. To overcome this problem, city officials under the leadership of Mayor Haydon Burns endorsed a complex, years-ahead sewer system and promoted a $34 million bond issue. Since most of the work is done within Jacksonville, the job becomes a matter of civic pride to the workers and the citizenry.

The American Marietta Co. and the Concrete Pipe Division of the Vulcan Materials Co., in joint venture, are the principal suppliers for the project. Since employees and management of both firms work and live in Jacksonville they too feel that it is something more than merely another big construction job.

The steel-reinforced concrete pipe, constructed under specifications prepared by Metcalf & Eddy, contains two wire-reinforcing cages, one placed inside the other. The forms are vibrated during castings to produce a solid mass of concrete with high strength and density. Finishing crews then smooth the joints and make sure concrete is compacted sufficiently to form a tight bond to the metal point rings.

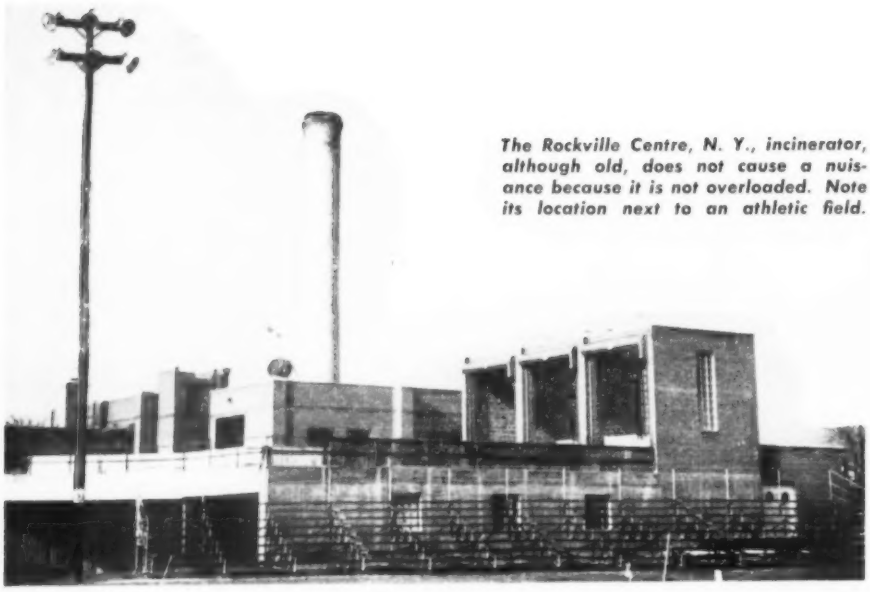
After steam curing, each pipe section is left in a vertical position in a yarding area for several days to attain full strength.

Special fittings are made up for turning corners in the line. These too are steel reinforced.

After proper curing the pipe sections are delivered to the coating contractor for application of epoxy (a special plastic lining). This coating affords protection against the sulfide gases sometimes found in sanitary sewers. The pipe is then trucked to the job site.

Pipe tests include those for strength, perfection and coating. These tests are made before delivery of the pipe to the pipe-laying crews.

A pipe-laying crew positions a joint of 72-inch-inside-diameter steel-reinforced concrete pipe. All sections are made and laid to strict tolerances to prevent excess leakage.



The Rockville Centre, N. Y., incinerator, although old, does not cause a nuisance because it is not overloaded. Note its location next to an athletic field.

When to Build an Incinerator

By **WILLIAM S. FOSTER**
Editor
The American City

Probably in no other phase of municipal sanitation have there been so many "abandonments" of expensively constructed installations as in the incinerator field. One study shows that out of 175 cities that have operated incinerators, 60, or 34%, abandoned their plants in favor of other methods of disposal. Moreover, it is hard to discover another field of municipal sanitation where there has been a greater desire to "modernize" — which means that the city wants to keep the plant, but recognizes that the functional design of the plant was not good.

We have water-purification plants built nearly a half-century ago, still using the old slow sand filter and the aristocratic, steam-powered, reciprocating pumps, and still doing excellent jobs. We have sewage-purification plants, built to some of the earliest designs of Dr. Karl Imhoff, still performing creditably. We have pipelines laid a century ago, still serving well, streets paved a half-century ago, still in use. But old incinerators still operating are hard to find and generally not pleasant to inspect. Even simple principles, such as an orderly way to receive and remove the burned residue, never occurred to these old-time designers. Someway or another they thought it proper that a workman be forced to shovel the ash out from beneath the furnace and load it by hand into a truck.

Consulting engineers will recognize that a portion of this has to be laid at their door. Many times, equipment suppliers have complained that reputable engineers, well known in the field, have asked for bids on multi-million-dollar projects, using little more than a few mimeographed sheets for plans and specifications. One rather awe-inspiring example was the specifications that a usually conscientious and thorough engineering firm prepared for an incinerator at an Army base, which went like this:

"One incinerator, complete with appurtenances, able to burn completely, the refuse generated at this base."

The fact that the lining of this incinerator burned out shortly after its construction should be no real surprise.

Of course, a local government must perform its services at the lowest and most favorable cost figure, consistent with the best interest of its people. Let us ask, therefore, what alternatives in refuse disposal there are.

The first, and cheapest, is the open dump—an evil-smelling, unsightly running sore in any local sanitation program. You need a remote, deserted area. You add to its undesirability by depositing refuse there in a messy, generally unorganized manner, appointing a refugee from Skid Row, usually living in a packing-box house, to preside over the operation. You accept the flies, rats, wild dogs, uncontrolled fires that this method must produce. And from a dollars-and-cents standpoint, you have a real bargain.

Some sanitary engineers have dared anyone to prove that the open dumps in their communities are indeed health hazards. One must agree with them, if, by proof, they mean that you must show that the particular rat that gnawed the nose off the baby in the crib came from the town's open dump. To most of us, however, the fact that a rat will travel from the open dump

This article is based on a paper Mr. Foster delivered at the recent American Public Works Assn. Congress in Seattle, Wash.

Although only a thousand feet from these houses, the Brookline, Mass., incinerator has created no problems for this neighborhood of fine homes.

to town is evidence enough of danger. The rat population at any open dump grows quickly, soon becomes too large to be supported on the succulent diet provided in the refuse, and soon some of these rats decide to go elsewhere. Some go to nearby farms and feed on grain. Some go to town and hide in warehouses and other similar places. Some climb into the cribs of babies.

The next alternative is the sanitary fill. If operated conscientiously, it *will* provide a creditable way to dispose of refuse without giving free board and room to rats and flies. Moreover, in virtually all cases, the cost of operating a sanitary fill is substantially lower than that of an incinerator.

The trouble is, of course, that sanitary fills use up land at an uncomfortably high rate. One frequently quoted average is 7 acre-feet of land needed per 10,000 people served per year.* Requirements can easily be double this.

You do *not* need to go to the expense of an incinerator if you have land available for the sanitary fill for the next 25 years. If you will run out of sites before that time, you should start thinking about an incinerator immediately. The incinerator will allow you to extend the useful life of your dumping area by four to five fold, and possibly more.

If sites are available but are far from your collection system, then another familiar factor arises—the cost of hauling. The cost of travel to and from the sanitary fill site can easily become large enough to cancel out the savings in operating a sanitary fill instead of an incinerator.

There are a number of rules of thumb, that actually can do no more than tell you when to start adding up your figures for a more detailed analysis. One of these is the distance hauled. If a truck must travel more than 10 to 15 miles further to the sanitary fill site than it would to an incinerator, start calculating the trucking costs and see whether a more centrally located incinerator will save you money. If you find that it will cost you more than about $1.50 per ton to haul to the sanitary fill, then again start the engineering calculations.

There are a number of other conditions that one should recognize before he is ready to build an incinerator. Let's take a quick, easy trip through a typical plant and look at them.

1. Scale—If you believe that there is no need to weigh the refuse as it enters, then you are not ready to build. Any plant you construct will be risking decay from the day it starts operating. A plant *must* have a scale so that you know what is going into it. Otherwise you never will know that it is overloaded until it is a foul, festering mess.

Furthermore, the scale pays for itself in insuring that the collection crews do a conscientious job loading the trucks. Without it, a half-loaded truck can slip into the plant undetected, particularly if it is a covered, compactor type.

2. Site—If you haven't considered

(Continued on page 125)

Sanitary landfills are excellent for refuse disposal at modest cost but can be expensive if haul distances to fill site are excessive.

* Some Sanitary Fill Operating Figures, THE AMERICAN CITY, Nov. 1947, pp. 13-15.

New Academy Presents City-Size Problems

The Air Force Academy is Colorado's newest city—and it has presented the same sewerage problems that might be expected from any other city planned for 10,000 residents. In transforming a huge tract of range land into a home base for the authorized cadet personnel, faculty, support personnel and their families, one of the essentials was a highly efficient collection-and-treatment system for sewage.

Dry climate and absence of a suitable receiving body dictated design and construction of a complete-treatment facility, with specified, high-quality effluent supplementing the non-potable water supply and used for irrigation of Academy grounds.

A high-rate, trickling-filter plant was constructed — with separate sludge digestion—to provide this complete treatment for all sanitary sewage collected. Its capacity of 1,300,000 gallons per day is expected to serve up to 10,000 persons, and provision was made in design for easy expansion.

The topography of the area allowed gravity flow in the collection system and through the primary treatment facilities. Fairbanks-Morse motor-driven pumps are used to circulate primary effluent, to lift sewage for secondary treatment and to circulate sludge through the tubes of a Pacific Flush Tank shell-and-tube heat exchanger.

Primary treatment consists of comminution (Worthington), grit settlement, clarification in two 30-foot - diameter Process Engineers primary clarifiers and filtration in two 60 - foot - diameter high - rate trickling filters.

Secondary treatment is provided by two 60-foot-diameter secondary filters and two clarifiers. Two fully-automatic Fischer & Porter chlorinators complete the treatment.

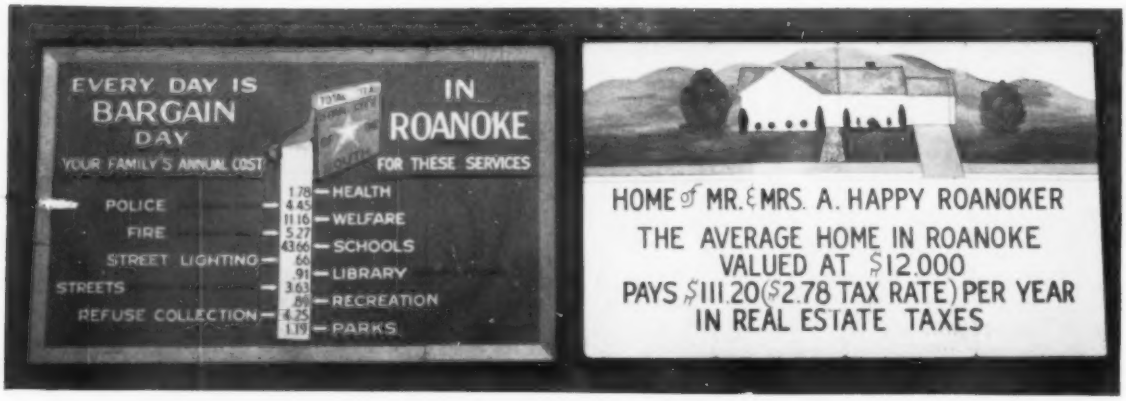
Sludge is digested in two Pacific Flush Tank digesters with floating covers and arranged for parallel or 2-stage operation. The sludge is circulated continuously through the heat exchanger, and the same F-M pumps are used to transfer sludge from one digester to another in two-stage operation.

Sewage gas is collected and used to heat water to 145 F so that sludge may be kept between 85° and 95 F. Natural gas is burned to make up any deficiency in sewage-gas supply, cutting off automatically when sewage gas is adequate.

The plant was designed for maximum flexibility, with provision made for a future primary clarifier, primary filter, secondary filter and secondary clarifier.

The location of the Air Force Academy presented many sanitary problems.

Billboards Tell Roanoke's Tax Story



Evoking many comments from Roanoke citizens—and visitors to the Virginia city—are two 8-foot-high, 16-foot-long billboards mounted on the side of the City Building. The two signs overlook a parking area and present the city's tax picture "at a glance."

Arthur S. Owens, Roanoke's city manager, reports that the billboard tax run-down has been endorsed by taxpayers and officials alike.

SILVER ANNIVERSARY

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FIRST IN 1935
AND STILL FIRST!

1935

In July 1935 One Hundred and Fifty (150) PARK-O-METERS were installed in Oklahoma City, Oklahoma. It was the World's first parking meter installation.

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YEARS OF LEADERSHIP!

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Today, more than 600,000 Park-O-Meters are in use in more than 1400 cities in every continent on earth and new installations are being added every day.

A QUARTER CENTURY OF ADVANCEMENT

Originally conceived and built by the late Carl C. Magee to use nickels only, the modern PARK-O-METER accepts pennies, nickels, dimes, quarters and tokens in payment for time periods ranging from 6 minutes to 72 hours thus meeting every curb-side and off-street parking requirement.

Magee-Hale

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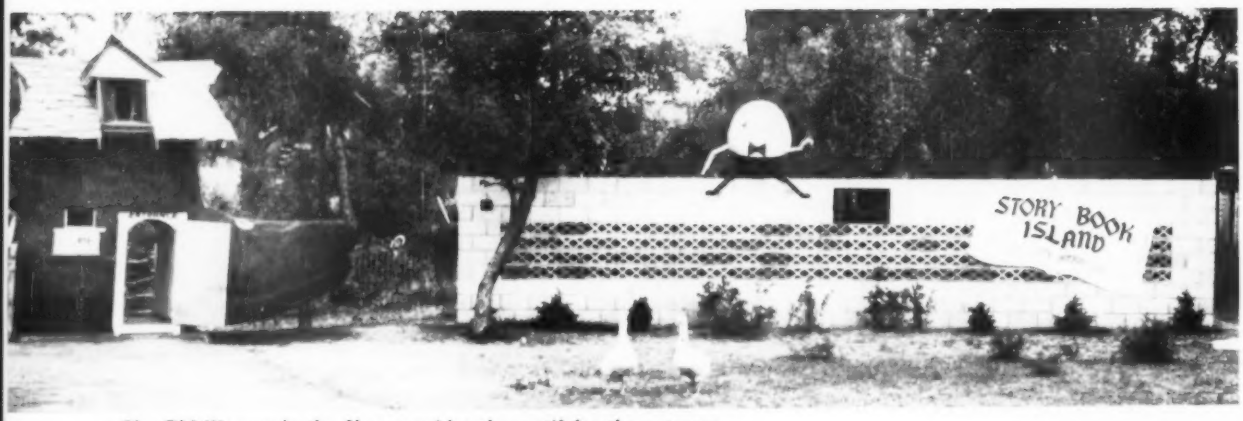

The Old Woman in the Shoe provides the motif for the entrance to the park. Note the live geese in the foreground.

Story Book Island

Rapid City, S. D., Park Department builds a children's park that generates city-wide cash-on-the-barrelhead support

A local flour mill donated the funds for this set.

By **MERLE GUNDERSON*** Superintendent of Parks

A year ago last September, the Park Department presented a program to the city council and to the general public of Rapid City which anticipated building a children's play area similar to the park in Oakland, Calif. We planned devoting 12 acres to the sort of things that children enjoy, and decided to capitalize on the fairy tales that they find so fascinating and that adults always remember so fondly.

In our planned park, geese and ducks wander at will throughout the fenced area. Live trout swim in the stream. Lambs, chickens, rabbits and white mice live in their own environment. Lambs would be part of the story of Mary and her little lamb. The chickens would form part of the "Henny Penny" story, the mice (although they are not blind) would be part of the story of three blind mice. Bunnies would perform a dual role, as part of the scene for Peter Rabbit, and also for Mr. McGregor's Cabbage Patch.

The idea took hold with great enthusiasm. The Rotary Club offered to administer a trust fund made up of donations from business houses, organizations and individuals. Various firms sponsored individual exhibits. For example, a flour mill company sponsored the Merry Miller set. A bank and a merchants' association co-sponsored the "Mary, Mary, quite contrary . . ." set. London Bridge (". . . is falling down") was sponsored, interestingly enough, by an engineering firm and a bank. Rub-a-Dub-Dub was sponsored by a laundry. There were many others.

With this enthusiastic help, we were able to build the park without drawing on the general tax fund. We have a donation box in the park and it brings us gifts which average $100 per day to keep it in tip-top condition.

The day that the park opened, over 10,000 persons visited it. We refused entrance to adults unless they were accompanied by a child. The public acceptance and appreciation of our Story Book Island has inspired the local Rotary Club to continue to expand this park into something beyond our present planning. We see it as a drawing card that brings not only our local people to these pleasant surroundings, but also visitors from out-of-town.

* Mr. Gunderson's work in developing this unusual children's park has won him a Certificate of Appreciation from the service clubs of his city.

EDITOR'S NOTE: For other articles on children's parks, see "Children's Zoo," Roanoke, Va., November 1954, p. 84; "New Creative Play Areas," Oakland, Calif., February 1955, p. 106 and "Dennis The Menace Playground," Monterey, Calif., April 1957, p. 115.

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Built to tackle the roughest terrain, stand up under rugged cutting conditions—your Yazoo Big Wheeler will stay in top running order!

Exclusive Bicycle-type wheels do the hard mowing jobs faster! Glide smoothly over high grass . . . won't bog down in loose turf, your toughest acreage. Assure easy handling—the maneuverability that makes Yazoo Master Mowers ideal for large cutting areas.

Simply designed, durably constructed—here's the power mower that's built to last! Your new 1960 Yazoo will give you years of efficient, trouble-free operation.

Acclaimed by commercial and municipal users all over America—see for yourself why Yazoo Big Wheels do the big jobs best!

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- Makes the roughest terrain a simple task!
- Stays in top running condition . . . at lowest possible maintenance cost!
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How to Measure Low Flows — or

Full Unimpeded Capacity Flows

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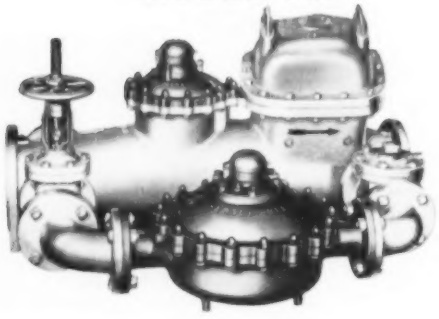


A dependable, accurate Hersey Disc Meter on the by-pass measures low rates of flow. When predetermined rates of flow are reached, the automatic lever valve becomes unseated and the main line proportional meter registers accurately the unimpeded flows through the main line. The combined readings of the bypass meter and the main line meter are your assurance of a revenue-producing combination.

UL FM ULC

Hersey-Sparling *Meter Company*

Hersey Products: Dedham, Massachusetts

Branch Offices in Principal Cities

When to Build An Incinerator

(Continued from page 119)

this you certainly aren't ready to build. Enough trouble has developed from overloaded incinerators, built to under-designed standards, so that Mr. and Mrs. Average Citizen scream to high heaven if you put one anywhere near a residential area. Your safest move is to see whether you have a site in a commercial or industrial area. If possible, give yourself plenty of land. Roughly 125 square feet per ton of rated capacity is a good guide.

Don't let your engineer talk you into thinking that the incinerator *has* to be adjacent to the area where you put the burned residue. It certainly doesn't. The incinerator ash will be possibly 5% and certainly no more than 20% of the original refuse volume. It is lots cheaper to burn the refuse in a plant at a central point and truck the ash to a disposal area, than to haul the entire volume to a remote site and burn it in an incinerator near the disposal site.

3. **Storage pit**—Before you build an incinerator, think this through with your designer. Most engineers much prefer the storage pit. Most operators do also, since it gives them some flexibility in the operation of the plant. Nevertheless, probably no more than half the incinerators wind up with these storage spaces.

If the plant has no storage pit, then the furnaces themselves have to serve in that capacity. This means that you will have to provide furnaces big enough to receive all the refuse in the peak day that will occur during the life of the plant. For example, if your anticipated ultimate peak load is 500 tons, and you have no storage pit, you will have to put this amount into the plant in about 6 hours. Thus, your furnaces will have to burn at the rate of 2,000 tons per 24 hours. You have to provide the storage anyway. The question is whether it is cheaper to build a storage pit or to build incinerator furnaces large enough to serve in that capacity—and if the latter choice is made, whether your operators are skilled enough and have enough extra facilities such as oil burners for supplemental heat to keep this large load burning at favorable temperatures.

If your designer insists on a floor-charging incinerator, at least make him design it so that you can supply a storage pit later if you wish. It is an inexpensive way to add capacity to a plant. If he favors the use of the storage pit, be sure that he isn't afraid to make it big, somewhere around 8 cubic yards per ton of rated capacity.

Now about the furnaces themselves. You aren't ready to build if you have succumbed to the optimistic claims that someone can build you an incinerator with a small furnace that will burn at astronomically high rates. If the incinerator is to be batch-fed, with cold refuse dropping directly onto the fire bed, those furnaces and combustion chambers ought to be built to standards like these:

	Per ton of rated capacity
Grate area	**0.8 sq. ft.**
Furnace and combustion chamber	**30 cu. ft.**

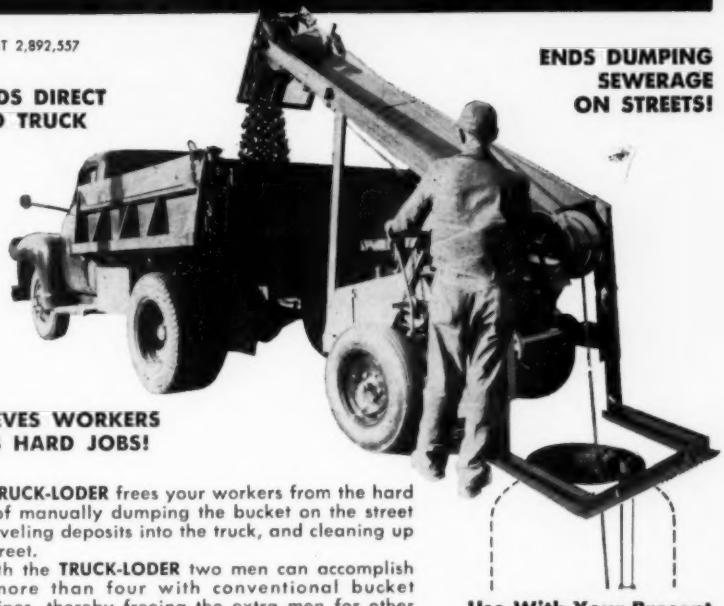
If the furnaces are of the continuous feed type, with burning ref-

IF YOU DON'T HAVE A TRUCK-LODER
Your Sewer Crew is WORKING TOO HARD!

PATENT 2,892,557

LOADS DIRECT INTO TRUCK

ENDS DUMPING SEWERAGE ON STREETS!



RELIEVES WORKERS OF 3 HARD JOBS!

The **TRUCK-LODER** frees your workers from the hard jobs of manually dumping the bucket on the street—shoveling deposits into the truck, and cleaning up the street.

With the **TRUCK-LODER** two men can accomplish far more than four with conventional bucket machines, thereby freeing the extra men for other important sewer maintenance work.

Users report the elimination of time-consuming operations has increased sewer-cleaning capacity by 40%. They agree that **TRUCK-LODER Bucket Machines exceed all performance estimates.**

Your Flexible representative will be glad to give you facts and figures at your convenience.

Use With Your Present Machines

Use Truck-Loders on the dumping end and your regular machines on the Pull-In end. Net result—two complete, modern Truck-Loder units.

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Ten 20-ft. lengths of rigid pipe after being coupled. Two workmen did this job in only 20 minutes!

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made of* ABS *Plastic

Workmen joining two sections of 1¼" rigid pipe.

RIGID PIPE GAS SYSTEM INSTALLATION OFFERS NEW PROOF OF SUPERIORITY OVER CONVENTIONAL TYPE

Big news for happy housewives in Gila Bend, Arizona—the convenience of gas utility service for the first time! Important news for utility companies everywhere—the 50% savings over cost of conventional pipe gained by use of Anesite rigid ABS pipe made of CYCOLAC throughout the system! Saved precious man-hours, too! Arizona Public Service Company completed the job in record time . . . insured a failure-free system with this lightweight, leak-proof, AGA-approved pipe. Another example of better service . . . bigger savings from rigid plastic pipe in vital municipal installations!

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use dropping onto the grate, then these figures may possibly be reduced somewhat.

Overloading is the enemy of every incinerator. Overloading is like a slow rot—it isn't detected until too late. Even if it is detected at first, one has a tendency to shrug it off as unimportant. If you overload a beam, it breaks. If you place too big a demand on a pipeline, water stops coming. But if you overload an incinerator, the plant just keeps humping along, trying to do its best but doing a poorer and poorer job until one day everybody screams that he is going to sue.

There is a little incinerator in the geographic center of Darien, Conn., that has been percolating along for 17 years without irritating anybody. There is a more recent plant in Brookline, Mass., close to expensive homes, that isn't bothering anyone and isn't going to. Rockville Centre, N. Y., has a plant so old that you have a hard time finding out how long it has been in service but it is not hurting anyone's feelings. The secret back of these blue-ribbon performers is that they haven't been overloaded. You are ready to build an incinerator that you can be proud of for many years when you build similarly.

There are a few other factors that you must consider before building an incinerator. Air pollution is one that shouldn't be neglected. If a city insists on certain air purity standards, it should be exemplary in seeing that its own equipment meets these standards. In general, if you have your furnace built to generous figures, the air pollution problem won't be acute. But if conditions demand it, you can supply some sort of scrubbing equipment such as water sprays or ponds in the bottom of the expansion chamber. If you can provide some way of cooling the gases in the expansion chamber, you automatically reduce the volume and encourage the precipitation of the fly ash.

Another is the factor of "unconsumed residue." You ought to have some assurance that the incinerator you are thinking of building will indeed burn the refuse that you plan to deliver to it. Your engineer probably will tell you that it is enough to specify that the furnaces must "burn thoroughly" the refuse contributed to it. If your engineer spells out what "thoroughly" means, you have a good one indeed.

In the first place, there should be no evidence of unburned material in the ash, by a visual inspection. Paper, cardboard cartons, organic garbage should not appear.

Next, you should be able to screen a sample, removing such large objects as tin cans and bedsprings, and then test the residue by subjecting the sample to a temperature of 1600°F for four hours. Ash from boilers, when subjected to this sort of test, generally shows from ½% to 5% unconsumed material. Incinerator ash ought to be in that range.

If your designer knows that you will expect this guarantee of performance, you can expect that the rest of the plant will be affected accordingly.

To make a gesture at summarizing, let us list the following:

1. You should build when you start running out of sanitary fill sites.

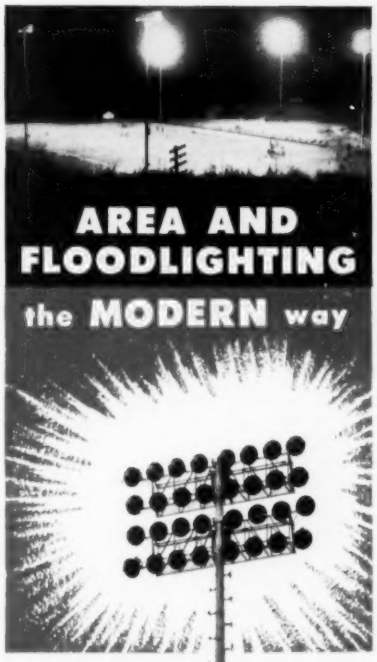
2. You should start thinking about building when you find that you are paying $1.50 per ton to haul your refuse to a sanitary fill instead of a suitable incinerator site. Or when you must send trucks 10-15 miles further to a sanitary fill site than to an incinerator site.

3. You should start thinking about an incinerator if you still are operating one of those festering sores in the municipal sanitation field known as the open dump. As a matter of fact, you can think about a sanitary fill also. You should resolve to do better one way or another.

4. You can start thinking about an incinerator when you are ready to accept reasonable design standards that will have a fighting chance of letting you operate your plant without nuisance.

We haven't said anything about composting, and if you are thinking of incineration, somebody is going to ask you. For the moment, it is enough to say that a composting plant costs more than an incinerator plant of equivalent capacity. Its success depends on the marketability of the product—which is expensive, economically attractive only to home-owners and possibly truck gardeners. If someone in your city wants to go into the fertilizer business, by all means, don't stand in his way. If he wants your refuse to make the fertilizer, cooperate, and give it to him.

But the policy of tying your entire municipal refuse sanitation program to a plant that depends for its success on the going price of a relatively low-grade fertilizer seems risky indeed. If you must gamble, don't let the health of your community be one of the stakes.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Designed to accommodate from 2 to 40 lights.
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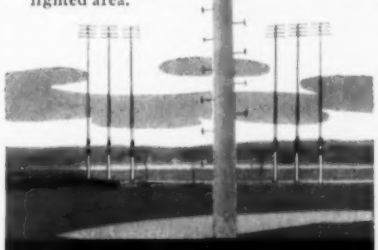
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NEW ultra-sonic vehicle detector

for . . . Signal Actuation • Traffic Counting Parking Garages • Parking Gate Control

The CHEKAR vehicle detector uses ultra-sonic (inaudible) sound waves to sense the presence of motor vehicles. Detection is independent of number of axles, weight, size, shape, or speed of vehicle. CHEKAR detection—the new, electronic solution to an old problem—gives you outstanding advantages over treadles, pressure pads, electric eyes, magnetic loops, and radar.

OVERHEAD SENSING UNIT — CHEKAR sensing unit mounts overhead. No traffic impact, no wear. No problems with snowplowing, ice, flooding, dirt. No pavement breaking needed to install or maintain.

TRUE "PRESENCE" DETECTION—CHEKAR senses actual vehicle "presence," from dead stop to over 75 mph. Motion *not* required.

RAZOR-SHARP PRECISION—CHEKAR gives individual detection of vehicles, even when practically bumper to bumper. Covers selected lanes without "spill-over" into other lanes.

PEOPLE-IMMUNITY—CHEKAR can be made "immune" to people. Pedestrians in detection zone do not disturb operation.

DIRECTION SENSING—CHEKAR detectors can be used to sense direction of vehicle motion.

INTERFERENCE FREE—CHEKAR ultra-sonic beam is not interfered with by snow, smoke, fog, road splash, stray light, or noise.

EASY INSTALLATION AND MAINTENANCE—Sensing unit contains no vacuum tubes, needs no a-c power, is practically maintenance free. Electronic chassis can be hundreds of feet from sensing unit if desired. All tubes are low-cost radio types, available everywhere. No. F.C.C. radio license required for equipment or maintenance personnel.

Write for descriptive literature and the name of our representative for your area.

CHEKAR detector accurately senses vehicles approaching traffic-actuated signal, ignores receding traffic on adjacent lane.

CHEKAR detectors give reliable, weatherproof, "people-immune" operation of these parking gates.

TOOLS FOR TRANSPORTATION

ELECTRONIC CONTROL DIVISION

GENERAL RAILWAY SIGNAL COMPANY

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3059

A small guide wheel and a Wald striping machine in the bed of the truck make lane striping a cinch.

Traffic Truck for a Small City

By JOE M. LACY
Planning and Traffic Director
Englewood, Colo.

A new radio-equipped truck-trailer unit has doubled the work output of the Englewood, Colo. (population 35,000) traffic engineering crew. It makes its two-man crew ready for any emergency any time.

Full use of the one-ton pickup bed at all times and a special trailer for setting signposts in concrete are

Costs
(Including Materials and Installation)

Truck:	
One-ton Ford truck chassis	$1,599.13
Utility body	488.50
Two-way radio	281.75
Roto-Beam emergency lights	169.70
Overhead rack for body	160.00
Portable welding rig	132.50
Paint and miscellaneous	57.00
Craftsman aluminum ladder	52.65
	$2,941.23
Trailer:	
Chassis and box (used)	$ 99.00
Sheet steel and welding	90.85
Paint and miscellaneous	26.15
	$ 216.00
Total cost	$3,157.23

The rubber-topped cabinet provides a handy walk for crewmen maintaining street name signs and pedestrian signals and signs.

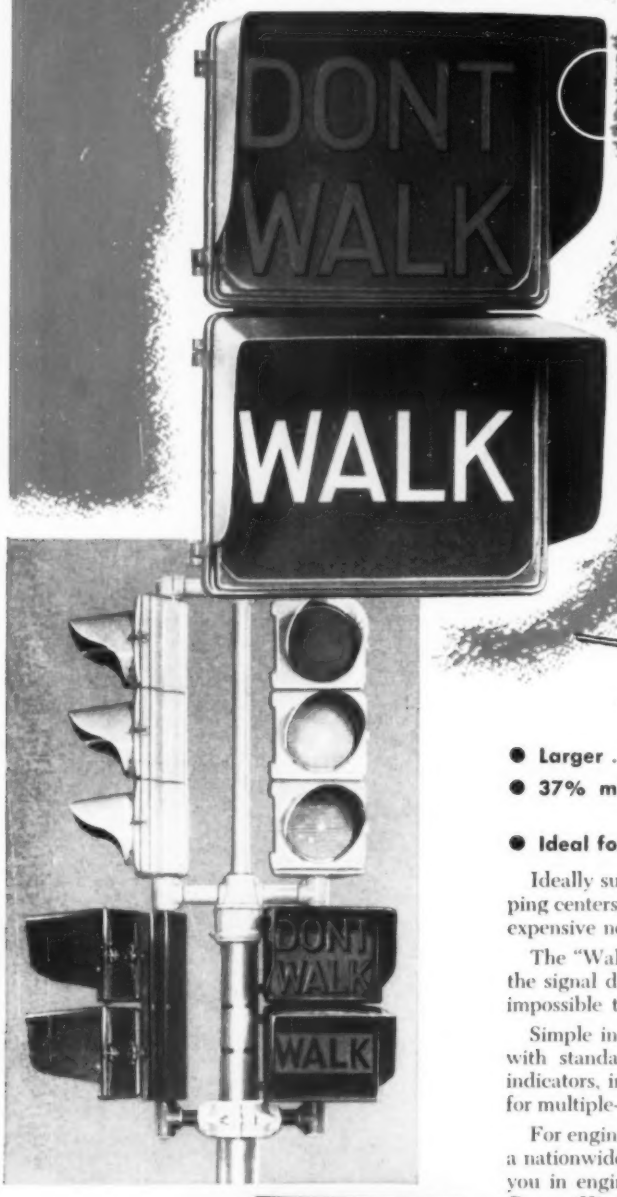
The Mall post-hole digger, carried in a cradle inside the truck bed, is a key item in a system enabling two men to set 40 steel posts in concrete at widely separated locations during seven working hours.

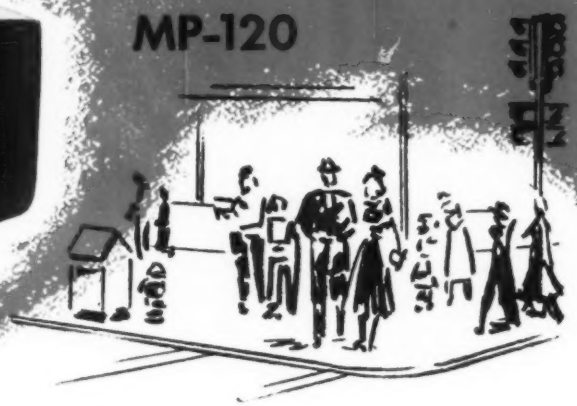
New CROUSE/HINDS

INCANDESCENT

Pedestrian Traffic Signal

MP-120





- **Larger . . . brighter . . . more readable**
- **37% more effective lens area . . . 9″ x 11″ prismatic lens**
- **Ideal for crossings 50′ - 60′ wide**

Ideally suited to residential areas, school crossings, small shopping centers, etc., the MP-120 offers significant savings over more expensive neon units designed for crossings up to 125′ in width.

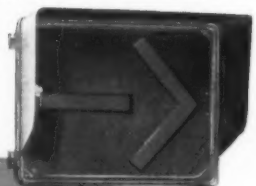
The "Walk/Don't Walk" legends and the rectangular shape of the signal distinguish it instantly as a signal for pedestrians . . . impossible to confuse with circular signals for vehicular traffic.

Simple in design, modern in appearance, the MP-120 mounts with standard signal brackets, without special fittings. Arrow indicators, in place of "Walk/Don't Walk" legends, are available for multiple-street vehicular indications.

For engineering and service assistance, Crouse/Hinds maintains a nationwide network of sales engineers and distributors to assist you in engineering and service situations. For the name of the Crouse/Hinds representative nearest you, call or write any branch office.

ABOVE — MP-120 Installed on Standard Signal

RIGHT—Arrow for Vehicular Use MP-110



WRITE for Bulletin #2716 containing complete information and specifications on the MP-120 Pedestrian Traffic Signal today.

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SYRACUSE NEW YORK

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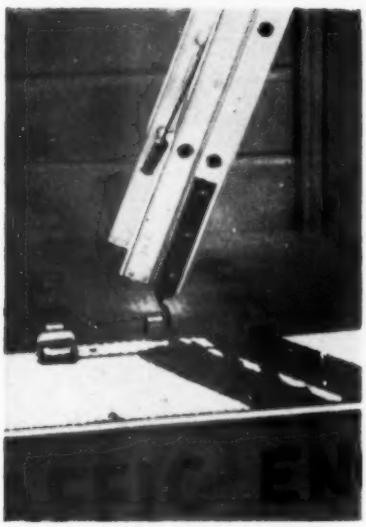

A steel plate with welded loops provides nine positions for the ladder; the ladder can lean at three different angles.

The aluminum extension ladder allows a man to work safely and comfortably 24 feet above the ground.

the keys to the flexibility of the new unit. Even the street striping machine made by Wald Industries, Inc., Huntingdon, Pa., usually limited to operation under its own power, now rides in the truck bed to paint lane lines in one-third the usual time.

The unit is basically a Ford one-ton pickup chassis with a utility body by Stahl Metal Products, Inc., 3490 West 140th Street, Cleveland, Ohio. The aluminum ladder was also provided by Stahl. The two-way radio was made by Motorola Communications and Electronics, Inc., 4545 Augusta Boulevard, Chicago 51. The portable welding rig was made by the Smith Welding Equipment Corporation, 2619 Fourth Street S.E., Minneapolis, Minn.

Number and Character of Traffic Engineers

Due to the variation in titles applied to those carrying on traffic engineering activities in various communities it becomes difficult to arrive at the number of persons engaged in the occupation. However, in every jurisdiction someone is attempting to accept the responsibility for such operations although he may not be operating under the title of "Traffic Engineer."

A good guide to the number of persons engaged in the occupation may be derived from the membership roll of the Institute of Traffic Engineers. It is assumed that most of the qualified engineers are members of the Institute.

The primary field of endeavor for traffic engineers is in public work in all agencies that have the authority and responsibility for operation of the street and highway system.

The Bureau of Highway Traffic at Yale University has given graduate training to almost 500 men since it was originally formed in 1926. The present employment of these graduates, as indicated in the following table, is considered typical of the distribution of traffic engineers.

Public and quasi-public	**76.5%**
Consulting	**12.5%**
Association	**6.5%**
Education and research	**4.5%**

Since most of the employment opportunities for traffic engineers are in public work there are a few personal characteristics and qualifications that are of utmost importance. As the traffic engineer goes up in the profession he must increasingly meet the public. He must have a good sense of public relations and be able to meet and make friends with citizens rapidly and easily.

The active traffic engineer is continually making new proposals. His studies indicate the need for change, and he must be able to explain the need for the change. He must meet and convince persons who are skeptical and even critical of his proposals. An important qualification is his dedication to his work. Such dedication is the quality that will cause the engineer to come back again and again as new proposals are first rejected.

The traffic problem is far from solved, though the engineering approach is recognized as the proper form of attack for the wide variation of problems that are presented. Continuously changing conditions indicate a continuity of need for traffic engineers.

Although some debate the question as to whether roads built the economy of the United States or whether the economy built the roads, it is apparent from history that the two go hand in hand. Since traffic engineering is concerned with the operational aspects of highway transportation it follows that the profession is intimately related to the country's social and economic structure.

EDITOR'S NOTE: This article is excerpted from "Traffic Engineer" by Thomas J. Seburn, Associate Director, Bureau of Highway Traffic, Yale University, New Haven, Conn. Published by Research Publishing Co., Inc., P. O. Box 245, Boston, Mass. 28 pages, $1.

Tough, dependable, new '60 Plymouth Police Cars are built rugged for hard Police work. They're low in first cost and upkeep. They're very comfortable.

All have Dura-Quiet Unibody.

Every Plymouth Police Car is built a new way—the solid Dura-Quiet Unibody way. Approximately 5400 precise welds join tough steel of body and frame into one sturdy, solid welded unit. This should let you keep Police Cars a long time and let you enjoy high resale value when you get ready to trade or sell them.

Each Police Car is built to do a special job.

There are three choices. The Patroller 6 with the new 30-D Economy Six engine is for city work. The Patroller Special 8 powered by the Fury V-8 is for city and suburban beats. The Pursuit Special 8 with a Golden Commando 395 engine is for highway and turnpike patrol. There's a choice of Police Emergency Wagons, too.

They're available with eight engine choices.

The three basic Police engines are: Plymouth's new *inclined* 30-D Economy Six—145 horsepower at 4000 RPM; the Plymouth Fury V-8—230 horsepower at 4400 RPM; and the Golden Commando 395 V-8—305 horsepower at 4800 RPM. The other five Police engines designed to meet your exact needs are extra-cost options.

They're equipped for rugged Police work.

There are big, heavy-duty 12-inch brakes with 251-square-inch lining area. And there are manual and optional automatic transmissions that will stand up in gruelling Police work.

Interested? See your nearest Plymouth dealer today. Ask him for a free Plymouth Police Car Catalog. There's absolutely no obligation.

A Chrysler-engineered product, built a new solid way to give you solid satisfaction.

SOLID PLYMOUTH 1960

Can Golden Gate Bridge Take Rapid Transit?

The five-county Bay Area Rapid Transit District has selected David B. Steinman, consulting engineer of New York City, to answer the question, "Can two lanes of rapid transit be added to the Golden Gate Bridge without impairing its physical safety?"

The problem is illustrated to a degree by the picture on the front cover of this issue of THE AMERICAN CITY. Here the Golden Gate Bridge is seen in toto from a Hiller helicopter.

General Manager John M. Pierce said, "If Marin County and the other North Bay counties are to be linked with San Francisco and the other counties of the Bay Area with a regional rapid transit system, that link must be the Golden Gate Bridge. Rapid transit on the Golden Gate Bridge would increase the bridge's overall transportation capacity many fold and would postpone for many years the necessity of constructing another, very costly bridge and the related highways and approaches in Marin County and San Francisco."

The selection of Steinman for the independent study, Pierce said, is in accordance with a plan developed jointly by directors for the transit and bridge districts under which "the question of the feasibility of rapid transit on the bridge can be resolved to the satisfaction of all parties, including the public."

Traffic Signal Guards Children

A push-button control, extreme left, turns on the red signal to stop traffic and permit safe crossing.

Sanborn, Iowa school and police officials faced with a burgeoning traffic flow on Route 18, with an increasingly acute hazard condition for children going to and from school, installed an "electronic policeman" to supervise pedestrian traffic.

Designed for mid-block crossings where "turning traffic" is non-existant, the signal was placed 200 feet from the intersection and given automatic control settings coincident with school-day schedules. During morning, noon and afternoon periods when maximum protection for school children is necessary, the standard, two-way, two-section red and yellow signal operates automatically in response to a child's pressure on the pushbutton. At all other times the pushbutton is inoperative, permitting the continual flashing of a yellow light, or a time switch if the controller discontinues signal operation on non-school days.

The signal normally displays a flashing yellow light to on-coming traffic. When the pushbutton is operated, the signal device shows a steady yellow (vehicle clearance interval) warning highway traffic; immediately following a steady red light is displayed (pedestrian interval) stopping all vehicles at the crosswalk. Children then cross.

Kenneth Erwin, Superintendent of Schools in Sanborn says: "The greatest advantage of our new school signal installation is the peace of mind it brings to school officials and parents in their knowing that maximum safety is now being afforded children going to and from school."

Mayor Harry Porth says: "The electronic traffic signal installation has been enthusiastically accepted by the whole community. Parents, school officials, and members of the Sanborn police force are impressed with the excellent protection."

The PA-301 signal, by Crouse-Hinds Co., Syracuse 1, N. Y., consists of two sections with red and yellow lenses in accordance with ITE specifications. Signal bodies are die-cast aluminum with baked yellow enamel finish.

With wide range and flexibility the electronically timed controller provides four calibrated control knobs for "vehicle minimum, vehicle clearance, pedestrian interval, and pedestrian clearance."

Speed Is No Help

In a report prepared by Dr. Oscar P. Hampton, Jr., and released at the recent National Safety Congress, the committee stated that "speed is seldom if ever a factor in the preservation of a life, and speeding ambulances result in more additional traffic deaths than lives saved."

GIVE YOUR MOTORISTS 50% MORE MANEUVERING SPACE WITH DUBL-DUALS

Rockwell Dubl-Dual parking meters insure a full *eight feet* to approach or leave a parking space. Other meter layouts allow only four feet for maneuvering and parking. Approach and exit are *safer* with the Dubl-Dual parking system, because traffic flow is smooth and fast. In one city, average parking time was reduced from 32 seconds to only 14 seconds. Parking time for women dropped from 37.4 seconds to only 15.9 seconds.

Dubl-Duals offer other key advantages . . . 23% lower initial cost, because two mechanisms are combined in one case; 50% lower installation costs, since only half as many meter stands are required; and lower maintenance costs, because two meters are checked at once.

For additional information on the complete line of Rockwell automatic and manual parking meters, write: Dual Parking Meter Company, Subsidiary of Rockwell Manufacturing Co., Pittsburgh 8, Pa.

AUTOMATIC DUBL-DUAL MANUAL

The only complete line of automatic and manual parking meters

DUAL PARKING METERS
another fine product by
ROCKWELL

The Safety and Economy of One-Waying

The Traffic Control Plan for Manhattan (New York) designed to reduce accidents and congestion, and increase street capacity, involves:

- **One-way operation on the north-south avenues.**
- **Retiming of traffic signals to provide progressive (staggered) signal timing on the avenues and major crosstown streets. This is possible only with one-way avenues.**
- **Reallocation of signal periods to reduce waiting time, and distribute available time more equitably between the avenues and crosstown streets. This, too, is possible only with one-way avenues.**

Studies conducted before and after the four latest conversions show the following improvements and advantages gained through one-waying:

	6th and 7th Avenues (with Broadway)	*7th and 8th Avenues (with Varick St.)*
Pedestrian accidents reduced	20%	30%
Total trip time reduced	36%	34%
Stopped time reduced	70%	65%
Number of stops reduced	72%	65%
Crosstown delay reduced	40%	53%
Crosstown capacity increased	20%	20%

The following reasons are advanced for the greater safety of one-way avenues:

1. **Progressive signals control vehicular speeds.**
2. **The approach of platoons of vehicles indicates to pedestrians that the green period will expire.**
3. **The duration of the red signal is reduced to within the patience tolerance of the pedestrian, encouraging voluntary observance of the signal.**
4. **One-half of the avenues' crosswalks become turn-free for pedestrians.**
5. **Midblock crossings are easier because pedestrians must only observe one direction.**

Crosstown traffic jams were reduced and traffic capacity increased through rescheduling the signal timing made possible by one-way avenues.

Investigations showed that delays to crosstown movement at typical intersections along 6th, 7th, and 8th Avenues, and Broadway were reduced an average of 53%. This result was achieved by providing 60 instead of 40 green periods per hour and by reducing the length of each crosstown red period during which traffic must stand still from 59 seconds to 35 seconds.

Under one-way operation, crosstown capacity measured 750 vehicles per hour at typical intersections as contrasted with hourly total of 624 under two-way operation. This 20% capacity increase was gained for crosstown traffic movement because the amount of green signal time facing crosstown traffic was increased from approximately 1,200 to 1,500 seconds per hour. This increased capacity is equivalent to building one new street at no cost for every five existing crosstown streets.

In terms of cost, there is an overwhelming balance in favor of the overall accomplishments of one-way operation as against the construction of a new artery. In 1947, a member of the City Planning Commission recommended the construction of a new avenue to lie between 5th and 6th Avenues and to extend from 34th Street to 42nd at an estimated cost of $70 million. This would have demolished valuable property, done little to relieve traffic congestion north and south except in the immediate area, and accomplished nothing in improving crosstown movement.

The same benefits described previously were achieved with the earlier conversion of avenues to one-way operation. Studies on 9th and 10th Avenues (converted November 6, 1948) showed a 26% decrease in total trip time and a 19% increase in traffic volume. On Columbus and Amsterdam Avenues (December 6, 1951) a 30% reduction in travel time and a cut of 75% in stopped time were obtained. First and Second Avenues (June 4, 1951) also showed substantial improvements following conversions. Total trip time was reduced 31% and stops, 80%. In addition, controlled speeds were established for these avenues through installation of the staggered light system. Pedestrian accidents were reduced from 10% to 30% with each such conversion.

With each step in the advancement of the Traffic Control Plan for Manhattan, substantial improvements have been achieved in the safe, efficient and convenient movement of persons and goods. These installations have made it possible to absorb the huge increase in vehicles entering Manhattan daily as compared with 10 years ago. Opposition, based largely on reluctance to change established patterns, has disappeared following the installation of one-way operation.

Bronx Zoo Toll Gates

When the motorist drives up to one of two toll gates at New York City's Bronx Zoo, he pays his fee and is ushered into a 900-car parking field. Entrance lanes are equipped with treadles for counting the number of vehicles passing through. Entrance equipment for the new parking field was designed and manufactured by Taller & Cooper, Inc., Brooklyn, N. Y., a subsidiary of American Electronics, Inc. At the end of the day the tally from the Taller & Cooper remote recorder is compared with the day's receipts to assure that the proper total is turned in.

FOR SUBDIVISION
LIGHTING...

SAN JOSE STANDARDIZED

with distinctive

UNION METAL fluted poles

San Jose, California, one of the fastest growing cities in the United States, has standardized on Union Metal 30-foot tapered, fluted steel Monotube poles for all new subdivision lighting.

This type lighting pole not only proved to be the most effective, but the permanency of construction, attractive appearance and economy of installation increased the preference for Union Metal.

Uniform lighting with Monotube poles has proved of value to many cities.

Residential subdivision lighting... standardized with 30' Monotube poles mounting incandescent luminaires.

UNION METAL

The Union Metal Manufacturing Company

Canton 5, Ohio — Brampton, Ontario, Canada

MONOTUBE LIGHTING POLES

Under the new 62,000-lumen lamps Fourth Street in San Rafael glows brightly where . . .

Eight Footcandles In San Rafael's Downtown

. . . the old 6,000-lumen lamps had shed little light.

By NORRIS M. RAWLES
Supervisor of Public Works

San Rafael, Calif., is a bustling, growing city of 18,000, the seat of Marin County adjacent to San Francisco Bay and the rolling hills that extend towards Mount Tamalpais.

Since it is the shopping center of the county, Fourth Street is a busy main street, frequently thronged with people from outlying areas. On Friday nights the merchants remain open until 9:00 p.m.

The Mayor and City Council directed the Public Works Department and the City Manager to make a survey not only of the downtown area but the entire city, and make recommendations for modernizing the ancient street lighting system. The result was the adoption of a "Master Street Lighting Plan" by the City Council on February 17, 1958. This plan, to be fully completed in a three-year period, was developed in close co-operation with Dan Andersen, city manager; James Barnes, senior illumination engineer, and Mark Jensen, commercial lighting representative of the local office of the Pacific Gas and Electric Co.

A trial demonstration block was installed by various manufacturers and the utility at no cost to the city. This office approved the 62,000-lumen fixtures.

To date, 18 months later, 60% of the residential areas are lighted by 2,500-lumen mercury vapor lights. Fourth Street, for its entire length, 1.1 miles, is lighted by 62,000-lumen silver-white mercury vapor lights with an average staggered spacing of 57 feet. The lights are installed on metal poles 32 feet high and the intensity is eight footcandles. The poles were manufactured by the Union Metal Manufacturing Co., the luminaires by the Westinghouse Electric Corp., and the lamps by Sylvania Electric Products, Inc.

Installed on Sundays

All of the lights were installed on Sundays to avoid inconvenience to the public. The before and after photographs of Fourth Street factually illustrate what a downtown shopping street can do to modernize in answer to the regional shopping center "threat." I am told that this lighting is second only to State Street in Chicago.

On a portion of Fourth Street, a single wire overhead was used. An engineering study of the exist-

from coast to coast

PR *system of traffic signal control*

Here is the ultimate in coordinated traffic control for cities and towns. Detectors at strategic locations sample key traffic flows for the centrally located Electro-Matic® Master.

Highly developed computing circuits **of the Master analyze the data, and send instructions to the all-electronic PR Locals at each intersection being coordinated. The most effective timing pattern for changing traffic conditions is maintained *continuously . . . automatically . . . reliably.***

For full details, write for Bulletin E-224.

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AUTOMATIC SIGNAL DIVISION

EASTERN INDUSTRIES, INCORPORATED

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ing underground system indicated many deficiencies and rather than undertake a costly replacement program, we decided upon a single wire overhead. Actually the appearance is not objectionable or even noticed by the average merchant, pedestrian or motorist.

The total cost of the capital improvement program for all installations was assumed by the Pacific Gas and Electric Co., without any capital outlay by the city. The city pays a set monthly service rate which includes all maintenance and replacements; the company owns all the lights.

The City Council feels this public money was well spent. Favorable reports have come from taxpayers as well as merchants. The city's police department is most enthusiastic over the improved lighting, as this letter from Chief Chiesa shows:

November 2, 1959

Dear Mr. Rawles:

With reference to the installation of the new mercury-vapor lights on Fourth and related streets, the following improvements have been noted by this department:

1. Decreased accidents on the lighted streets.
2. Fewer burglaries, prowlers, etc.
3. Women who were afraid to walk along darkened streets now take advantage of the improved lighting.
4. The police units patrolling these well-lighted areas are quicker to detect wrongdoing.

CHARLES J. CHIESA
Chief of Police

On State Street

State Street's newest lights, turned on September 24th, consist of four poles in front of Sears, Roebuck & Co. on the east side of State Street between Van Buren and Congress. According to J. Chalmers O'Brien, President of the State Street Lighting Association, the new poles are a continuation of the world-famed lighting system installed on State Street, Chicago, a year ago.

Fluorescents in Pontiac Are Appreciated

Installation of 80 fluorescent street lighting fixtures in Pontiac, Mich., has "brought about a brighter and more cheerful downtown area," according to Mayor Philip E. Rowston. "Our city commission could have viewed the incandescent installation as adequate, but we moved in the general direction of supporting central business district planning," Mayor Rowston continued, "and the business people and the city as a whole feel these well-lighted streets make our city look alive. People circulate more. We believe this is only a step towards further changes in other areas of the city."

John W. Emerson, city electrical superintendent, G. A. Low and George Korten, Consumers Power Co., designed the system using six-foot, four-lamp General Electric units with Power Groove lamps.

"We believed the fluorescents would be better for the downtown area since they give soft, glare-free illumination. These particular units illuminate not only the pavement and sidewalks but help brighten store fronts," said Mr. Korten.

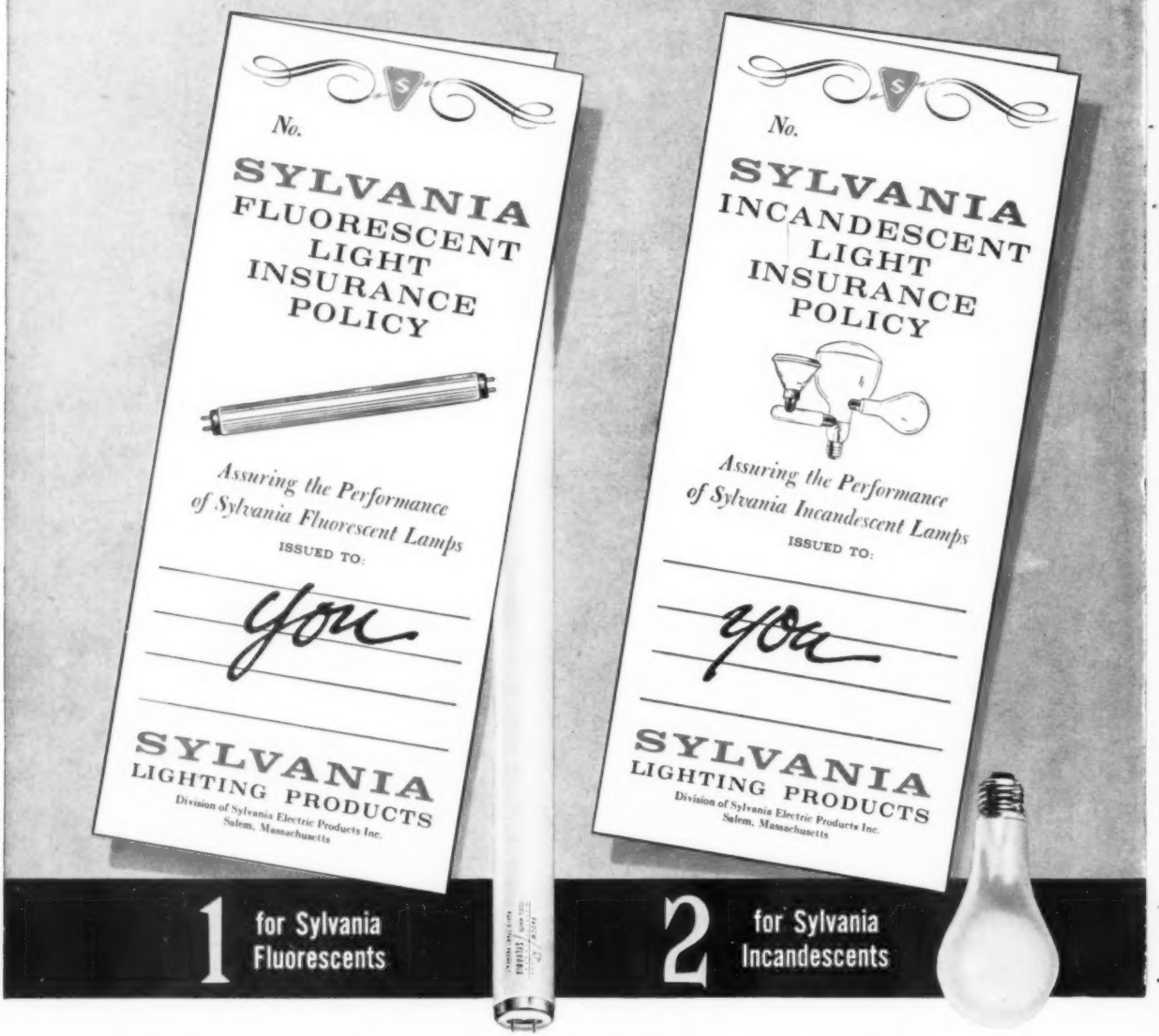
The units are mounted at a height of 30 feet and spaced about 120 feet apart on both sides of the street to provide three footcandles.

Pontiac's street lighting modernization began in December 1955, with the experimental installation of ten 20,000-lumen street lighting fixtures in the Civic Center area. "Since that time we have pursued a modernization program using fluorescent lighting which has included the relighting of one and one-half miles of arterial highway with seventy-two 20,000-lumen units," the mayor concluded.

Mayor Philip E. Rowston (left) receives some pointers on his community's new downtown fluorescent lighting from Edward L. Karkau, Consumers Power Co.

Now Sylvania issues 4

AND YOU ARE



How can Sylvania do a thing like this? Issue one insurance policy after another to *guarantee* that you get maximum lighting value . . . or your money back! Simple!

Because Sylvania in one lighting product after another *consistently* gives you the lowest TCL—Total Cost of Lighting—of any brand. (TCL equals cost of lamp or starter plus power plus maintenance.)

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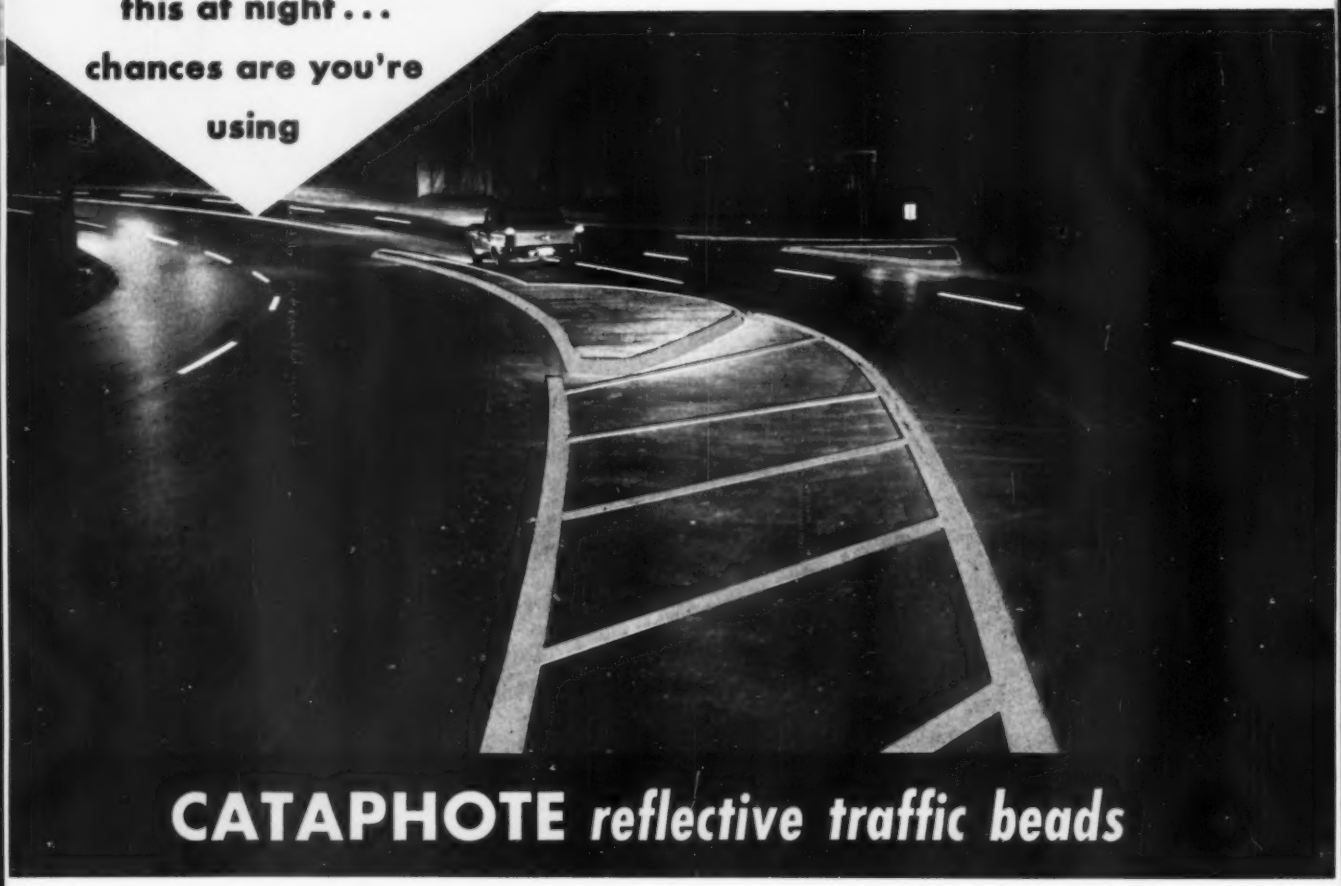

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The Vine Street extension of the Schuylkill Expressway cuts for a mile through downtown Philadelphia and connects with the Benjamin Franklin Bridge across the Delaware River to New Jersey.

Philadelphia Expressway Lighting

The mile-long $12 million Vine Street extension of the Schuylkill Expressway in Philadelphia, Pa., is now lighted by General Electric fluorescent luminaires, each with two 72-inch power groove lamps. These are mounted in continuous rows at the top of the side walls in each main underpass. At night only every sixth luminaire, in these four continuous rows, is lighted. These luminaires spaced at 39 feet, center to center, provide eight footcandles.

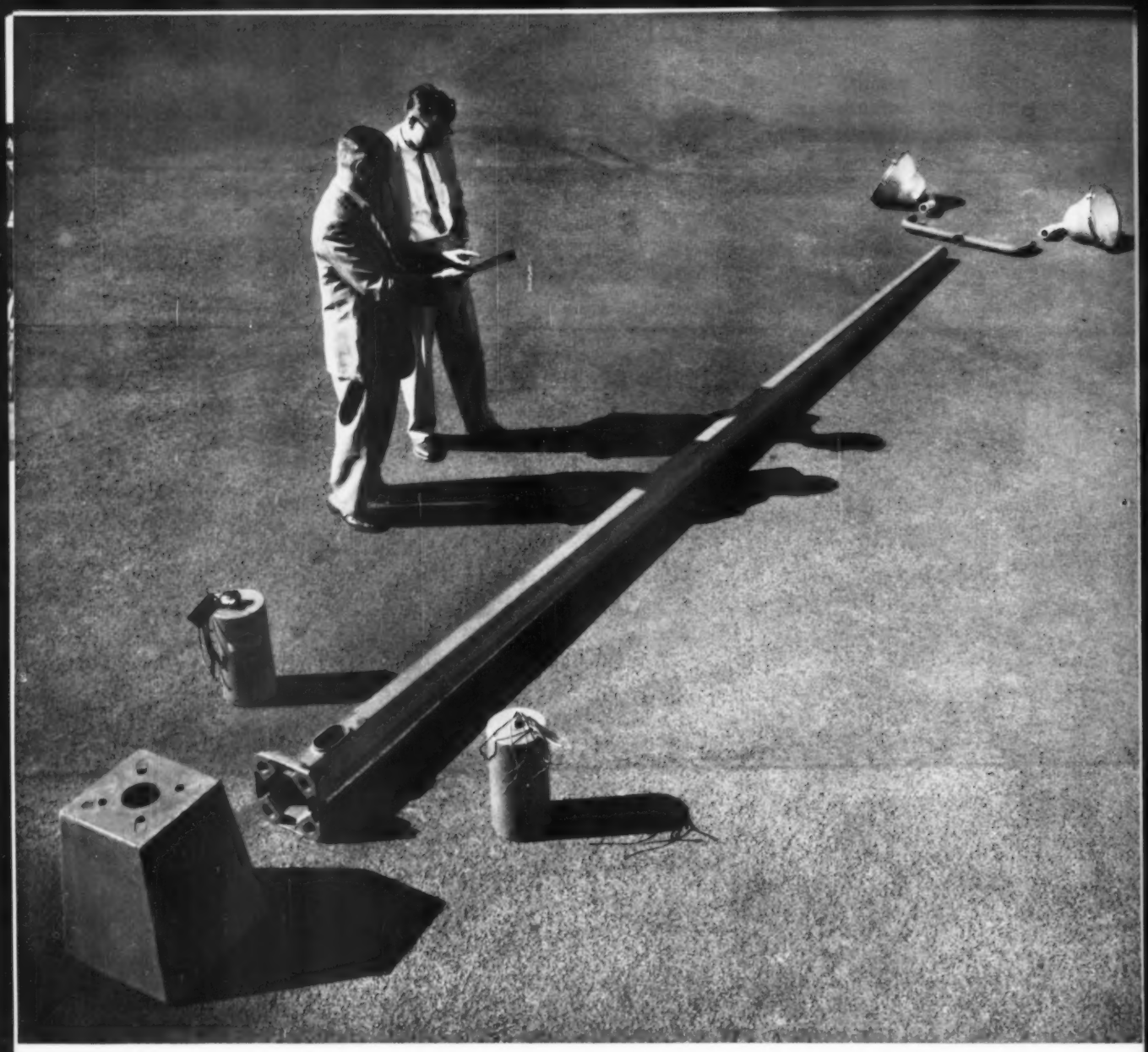
To the east of the main underpass, Vine Street extends under several short underpasses. This section, including the open areas between, is lighted with similar fluorescent luminaires spaced at 39 feet, each side, also producing eight footcandles.

In the open areas short poles are mounted on the center crash wall and twin General Electric fluorescent luminaires of the street-lighting type are mounted to carry out the uniform design for the entire project.

"We believe we have provided the proper balance of light between the outside and the underpasses for both day and night driving. This helps eliminate driver eye strain and accident hazards as motorists travel this high-speed extension," said Harold E. Mason, street lighting engineer of the Philadelphia Department of Streets.

The extension's two main underpasses normally would be heavily shadowed during daylight hours. However, between 50 and 60 footcandles of illumination are maintained in these areas so drivers scooting in and out of bright sunlight will have only a minimum of eye adjustment.

Harold E. Mason, chief street lighting engineer of the Philadelphia Department of Streets, in one of the tunnels of the Vine Street extension where daytime lighting prevents driver eye strain while driving in and out of the sunlight.



Revere's complete line of matched outdoor lighting equipment means peak efficiency and easy installation

Shown above are the components of a Revere outdoor lighting installation. Every component — pole, base, bracket, lights — is *perfectly matched* to every other component, so the completed installation is exactly right for the job. Components "fit" right to make installation easy, they are structurally matched for strength and balance, and "design-matched" to give peak lighting efficiency for the application.

Revere offers the widest selection of outdoor lighting equipment available from any single source. You can get on-time delivery of Revere fixtures for incandescent, mercury or fluorescent lighting, as well as hinged, rigid, separable poles and accessories. Ask your wholesaler about the advantages of specifying Revere equipment.

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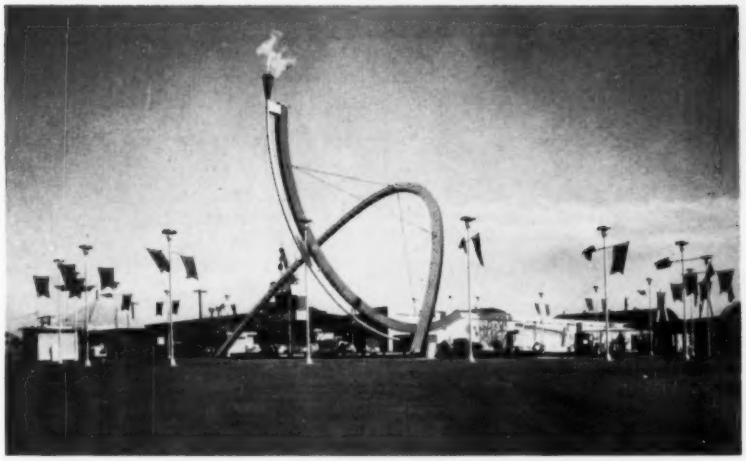

The post-top luminaires (with flags) harmonize with the exhibit of Oregon's Centennial Exhibition.

Temporary Lighting at Oregon Centennial

Fairs and expositions require the most in lights and only for a short time. This problem, of course, faced the Oregon Centennial Commission. The Centennial grounds, specially prepared, needed efficient lighting at the main entrance and also in the exhibit area.

Although adequate lighting was needed for pedestrian convenience and safety, it had to be at a comparatively low level so that it would not detract from the decorative lighting nearby.

Post top luminaires from Line Material Industries met the appearance and economy requirements. Their added advantage was easy handling since they were made of aluminum. Convenient handling size meant the units could be transported and re-installed at other parks after their limited use at the centennial grounds was over.

Lighting requirements for the walkway and bus stop at the main entrance were met by installing 22 units mounted on 14-foot poles. Those in the exhibit area were at a height of 20 feet.

The 21 units in the exhibit area were placed in a 150-foot circle and provided sufficient but low level illumination. IES Type V light pattern was used here. Poles to hold colorful flags were inserted through the standards.

The architects are Stewart and Richardson of Portland, Oregon.

For a Brighter City at Night

To read these Outdoor Lighting pages of THE AMERICAN CITY one might gather that the cities are thinking of little else than dolling up for night shopping, foiling footpads and keeping pedestrians and automobilists out of hospitals or worse.

Yet, truth to tell, "relatively few cities and towns are adequately lighted. On an estimated total mileage basis we have lighted only 7% of our streets to the Illuminating Society's code recommendations." The quote is from a 20-page booklet entitled "A Bright City Is A Safe City," published and offered free as a public service by Kerrigan Iron Works Co., Nashville 2, Tenn. What this booklet is about will be shown in this article.

Its purpose, like the purpose and results of good street lighting, is to save lives, because accidents after dark account for 59% of all persons killed and over 41% of traffic injuries. Street lighting can reduce crime and police officials all over the country consider well-lighted streets a deterrent to crime, like having extra policemen. It increases business, for everybody knows that bright streets attract more customers. It inspires pride, for good street lighting has a marked effect on the whole community. It saves money, for there are fewer traffic accidents and less crime.

Municipal officials, working with utilities, must prepare an over-all plan in four steps:

***Traffic studies*—Traffic flow and density studies of business sections, arteries, main and secondary thoroughfares, and residential zones are necessary.**

***Layout of lights*—A working drawing should be prepared to show locations, lamp types and sizes, guided by the American Standard Practice for Street and Highway Lighting, sponsored by the Illuminating Engineering Society.**

***Which first*—Immediate attention to the most inadequately lighted streets is necessary first.**

***Cost plan*—A five-year plan permits annual improvements until your goal is gained.**

Following a discussion of some factors which influence visibility, are reproductions of editorial articles presenting relighting projects in specific cities and towns. These include outstanding projects in Nashville, Shreveport, Miami and Miami Beach, River Rouge and Greer, S. C.

All-America Cities for 1959

★

ALTON
Illinois

DE SOTO
Missouri

EAST ST. LOUIS
Illinois

FARGO
North Dakota

LAMAR
Colorado

NORFOLK
Virginia

SAN JUAN
Puerto Rico

SANTA FE SPRINGS
California

SEATTLE
Washington

VALLEJO
California

WINSTON-SALEM
North Carolina

★

Eleven municipalities in ten states won recognition this year as "All-America Cities" in the annual competition sponsored jointly by the National Municipal League and *Look* Magazine. The awards recognized grass-roots accomplishments in overcoming urban growth problems in some cases, and stagnation in others.

Alton, Ill.

. . . started on its path to civic distinction when a sewer clogged. Enough of the 48,000 citizens in this river town decided that other parts of Alton could be improved also to start things rolling. The result was manifold. The public endorsed the council-manager plan after rejecting it just four years previously. The new citizen-supported administration initiated programs such as sewerage, streets and street lighting, industrial and commercial development, urban renewal and public housing projects, city planning and zoning. The improvements have prompted many annexations, including many industrial properties which have increased the city's tax base by about $30,000,000.

De Soto, Mo.

. . . a two-time winner, received its award this year for resourceful, grass-roots work in overcoming what looked like economic disaster. In 1958, two of its three industries closed their doors, throwing out of work 80% of the jobholders. DeSotoites personally raised $300,000, formed a municipal industrial-development corporation, successfully attracted two new industries, have a third on the way and are negotiating with a fourth.

East St. Louis, Ill.

. . . won recognition for the long, hard work of local citizens, first to abolish the city's unsavory reputation, and second to initiate a broad-gauge civic-improvement program. The people had to fight for four years to rid themselves of organized gambling and vice. After succeeding, these same civic-minded citizens continued with constructive measures such as a labor-management code of ethics; an urban-renewal bond issue; new schools and parks. The city has experienced an upsurge of industry and construction that has created 1,500 new jobs.

Fargo, N. D.

. . . built a successful civic growth on a Master Plan, backed by Citizens for City Planning. The people in this Great Plains city of 13,000 went to the polls and approved a $1,725,000 bond issue for a new Civic Center with a modern city hall and civic auditorium. The public's voluntary contributions support a school for retarded children and a school for deaf children as well.

Lamar, Colo.

. . . put itself on the All-America City team by building a topflight Community Building to help provide a center of social, athletic and cultural interest. Lamar's Dudes and Dames, 618 school children who have assembled into a colorful square dance organization, are only one of the civic dividends of the auditorium.

But Lamar has other signs of constructive progress. It has a new sewage treatment plant financed by service charges, new water wells, schools, hospitals, a new airport, and a new swimming pool.

Norfolk, Va.

. . . gained recognition for its tremendous effort to wipe out slums, organized vice and tuberculosis. Its slum-clearance program, started in 1950, has cleared more than 325 acres of bad housing, and has relocated more than 5,000 new families. The city currently is building an industrial park, a civic center and a new hospital.

Santa Fe Springs, Calif.

. . . is probably the youngest city ever to win a place on the All-America team. A few years ago, ambitious but trusting homeowners learned the harsh facts—that their new homes were in an unincorporated area, that there was no urban

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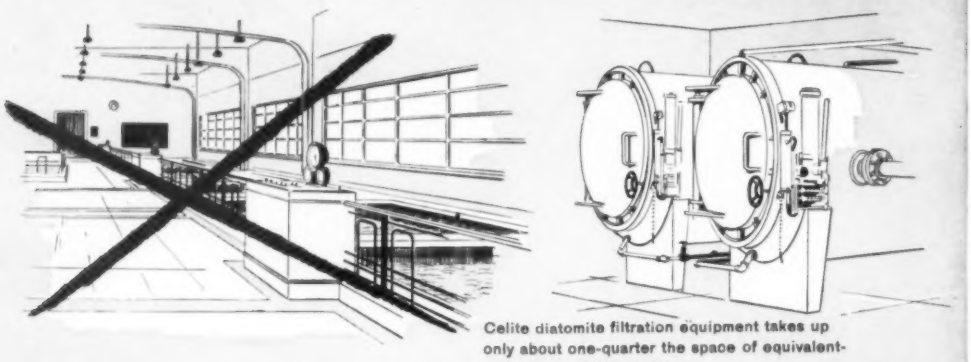

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2. USE LOWER-COST CONSTRUCTION

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You save filtration construction dollars these 2 ways with Celite diatomite

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Also, diatomite's lighter, smaller equipment permits you to use lower cost building methods and materials. For example, a simple concrete slab with light framing and siding instead of a large reinforced concrete-and-brick building with built-in concrete filters#.

Diatomite filter equipment is so compact because it provides a much larger filter surface in proportion to size of equipment. In many cases, raw water can be filtered directly—pretreatment facilities can be eliminated. For Celite removes more suspended solids, including amoebae and algae, and turbidity is usually much lower.

Mined by Johns-Manville from the world's largest and purest commercial diatomite deposit, Celite is carefully processed for purity and uniformity. It is available in a wide range of grades for best practical balance of clarity and flow rate with any suitable filter. For further information, see your nearby Celite engineer. For free technical reprints and illustrated brochure, write to Johns-Manville, Box 14, N.Y. 16, N.Y. In Canada, Port Credit, Ont.

JM PRODUCTS

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

#*See Comparison Studies of Diatomite and Sand Filtration* by G. R. Bell, Journal American Water Works Association, September, 1956 or write for free reprint.

JOHNS-MANVILLE

government to provide street lights, schools, refuse collection and other needed services. Rather than bemoan their fate, the Santa Fe Springers decided that if they were without a local government, they would form one. Today, their new municipality is a going concern, complete with street lights, schools, parks and other services, run by a council-manager government.

San Juan, Puerto Rico

. . . faced its problem of burgeoning growth with the same resourcefulness and courage that the Commonwealth of Puerto Rico has shown in its "Operation Bootstraps." San Juan's population has skyrocketed from 237,000 twenty years ago to 600,000 today, placing what looked like insurmountable loads on the city. However, some 9,000 members of the city's civic organizations set to work to improve housing, raise money for new hospitals, and organize play programs that included more than 100 Little League teams. Various religious groups expanded their parochial schools, doubling their enrollment to ease the load on the public schools.

Seattle, Wash.

. . . won its place by its metropolitan approach to its sewerage problem. It was area-wide, and the beautiful beaches were fast becoming foul. Seattle and its outlying communities first tried to organize a metropolitan government to solve many of their common problems. However, the voters turned this down. So they tried again, this time selling clean beaches instead of supergovernment. This measure passed handily.

Vallejo, Calif.

. . . won distinction by overcoming antipathy and suspicion between "insiders" and "outsiders." Only two years ago, Vallejo's boundaries looked like something out of modern art. The city was an old, shapeless comglomerate, intermeshed with inhabited, unincorporated areas. Efforts to join the two met with apathy and suspicion. However, the possibility of a water district to serve the "outsiders" served as the spark that overcame this emotional barrier. By strong public action, 17 annexation elections won voter approval, and today Vallejo is united and efficient.

Winston-Salem, N. C.

. . . presented as evidence of its right to be on the team its improvements of water supply, sewerage, new schools; its extra taxes levied for libraries, a boys' club, and various other recreational activities. It has a city-county planning board whose rulings reach far beyond the city limits themselves. This board reserves sites for such urban-growth purposes as schools, parks, streets, and other facilities.

"Second Team"

Honorable mention in this year's competition went to eleven additional cities: Abilene, Tex.; Anadarko, Okla.; Baldwin Park, Calif.; Burbank, Calif.; Grants, N. Mex.; Green Forest, Ark.; Honolulu, Hawaii; Lakewood, Ohio; Sioux City, Iowa; Springfield, Mass.; and Washington Terrace, Utah.

The jury that selected the All-America Cities Award this year from among the more than 100 applicants included 12 men and women representing business, professional, industrial, labor, and educational services. The foreman was Dr. George H. Gallup, director of the American Institute of Public Opinion.

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ABOUT A COMMUNITY

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ARE SIGNS OF PRIDE!

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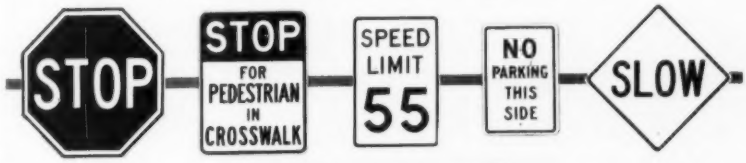

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New Jersey Makes Regional Renewal Study

The Bureau of Planning of the New Jersey Department of Conservation and Economic Development is undertaking a nine-county survey of the metropolitan area lying within the New York City region. The study will explore the possibility of approaching the problem of urban renewal on a region-wide basis.

This region includes 73% of the entire population of the State of New Jersey; 30% of New Jersey's land area; 76% of all New Jersey manufacturing employees; and 83% of all New Jersey industrial plants.

Two-thirds of the $195,160 project is being financed by the Federal Housing and Home Finance Agency. The State of New Jersey and Rutgers, the State University, will provide the balance.

The federal portion of the grant was issued from the Demonstration Program Branch of the Federal Urban Renewal Administration.

The project will be undertaken through a series of studies and surveys, one of which will be a survey of the physical conditions of the residential areas of the region. Another will develop estimates of the annual cost to municipalities in their undertaking of extensive urban renewal programs. The current urban renewal program as it applies to the region also will be considered to ascertain the program's effect on the region. This latter study should provide guides and a new direction to the present program and will also show whether the program is meeting the growing needs of the region in terms of various land uses.

Studies of the social and economic implications to the region of an ambitious urban renewal program will be made. Financial as well as organizational ability of the various types of New Jersey municipalities will be considered to determine their capacity to meet their needs as viewed from the regional vantage point.

A major purpose of the survey is to ascertain whether or not the urban renewal program can be better carried out on a regional basis or piecemeal as it has been in the past.

Commissioner Salvatore A. Bontempo, of the Department of Conservation and Economic Development, invites any comments and criticisms on the present project. The project will be completed in April 1961.

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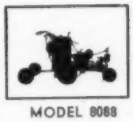
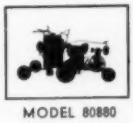

MODEL 8088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3. LOWEST MAINTENANCE COST PROVEN by fleet records. "Saving 33%" (taxi fleet, New York)—"Over 25,000 miles on each Lark in severe Police service—with minimum maintenance" (police department, Indiana).

4. LOWEST REPAIR COST PROVEN by fleet records. "2.1 mils per mile, against 3.2 mils per mile" (car rental, Colorado)—"No repairs, no new parts, after 10,000 miles on each Lark" (telephone company in Oregon).

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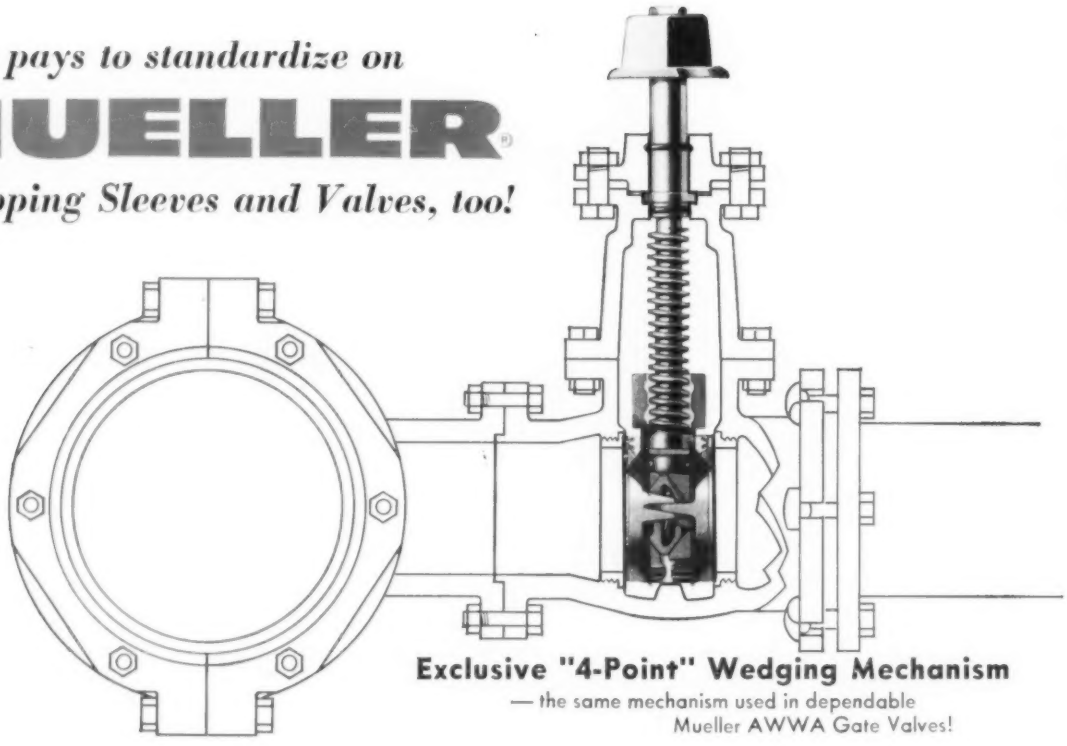


Exclusive "4-Point" Wedging Mechanism

— the same mechanism used in dependable Mueller AWWA Gate Valves!

Save time and money by specifying "quality-matched" Mueller Tapping Sleeves and Valves throughout your system.

Laterals and branch main connections may be made quickly and easily with unskilled labor under full line pressure and with no loss of water.

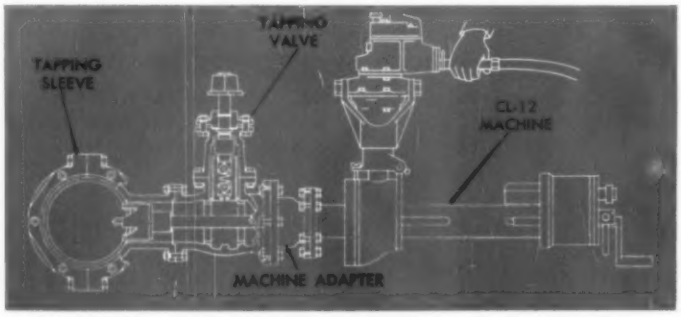
The extra long length and heavy cross sections of all Mueller Tapping Sleeves actually strengthens the main at the lateral connection. Mechanical joints or calked joints permit rapid pressure-tight installations. Just two sets of end gaskets readily adapt a nominal size of mechanical joint sleeve to all classes of cast iron pipe regularly used.

Smaller inventories, gained storage space and easier maintenance are yours if you've also standardized on job-proven Mueller Gate Valves. The wedging mechanism of non-rising-stem Mueller Tapping Valves is identical to that of Mueller AWWA Gate Valves. In fact, the parts are completely interchangeable! "O" ring stem seals or conventional packing are also available.

Mechanical joint and calked type sleeves and valves are available in a full range of main and branch main sizes.

Write for complete information and specifications on Mueller's full line of Tapping Sleeves and Valves.

Use the Mueller CL-12 Drilling Machine to install Tapping Sleeves and Valves faster than ever before.



These are just a few of the bonus features found in all "quality-matched" Mueller products for water distribution systems. Add up these features and you'll see why so many cities and towns have "standardized on Mueller."

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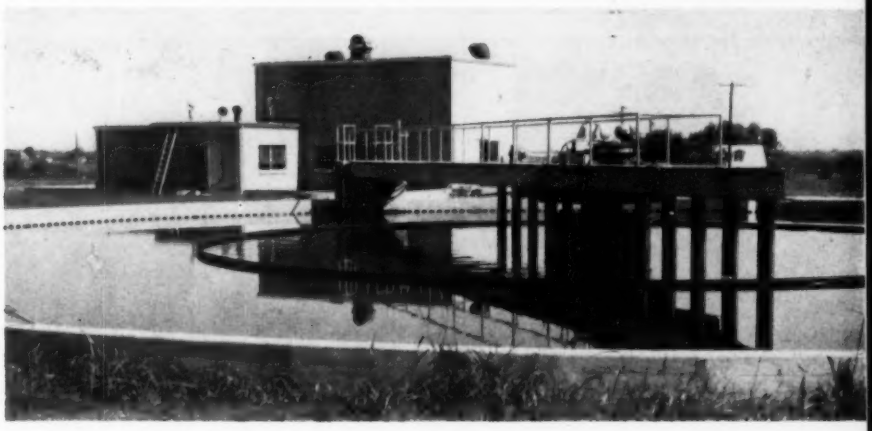
Factories at: Decatur, Chattanooga, Los Angeles
In Canada: Mueller, Limited; Sarnia, Ontario



The plant provides chemical treatment, flocculation, clarification, rapid sand filtration, and telemetering. Control of all facilities except central station pumping is provided here.

A Surface Supply + Water Security

Waxahachie, Texas improvement provides better water, a recreational area and radio-active fallout protection for its supply in the event of atom attack

The spillway view of the Waxahachie Reservoir, which serves as a 13,500-acre-foot supply as well as a new boating, fishing and picnicking area. The white chalk cliff (at left) was cut to allow the construction of the spillway.

By **H. R. YUNGMEYER**
City Manager

In the face of many problems, Waxahachie, Tex., has managed to build a reservoir supply, a long transmission main, a treatment plant and—with money left over from estimated costs—has improved its distribution system and erected a new elevated tank.

When increasing demands forced the city to investigate various means of expanding its water system, city officials found that decisions and problems come in bunches. The first consideration (whether to expand existing facilities or develop a new supply source, with attendant distribution headaches) convinced officials that a survey was in order, so they retained Forrest & Cotton, Dallas consultants, to conduct a study and present a plan.

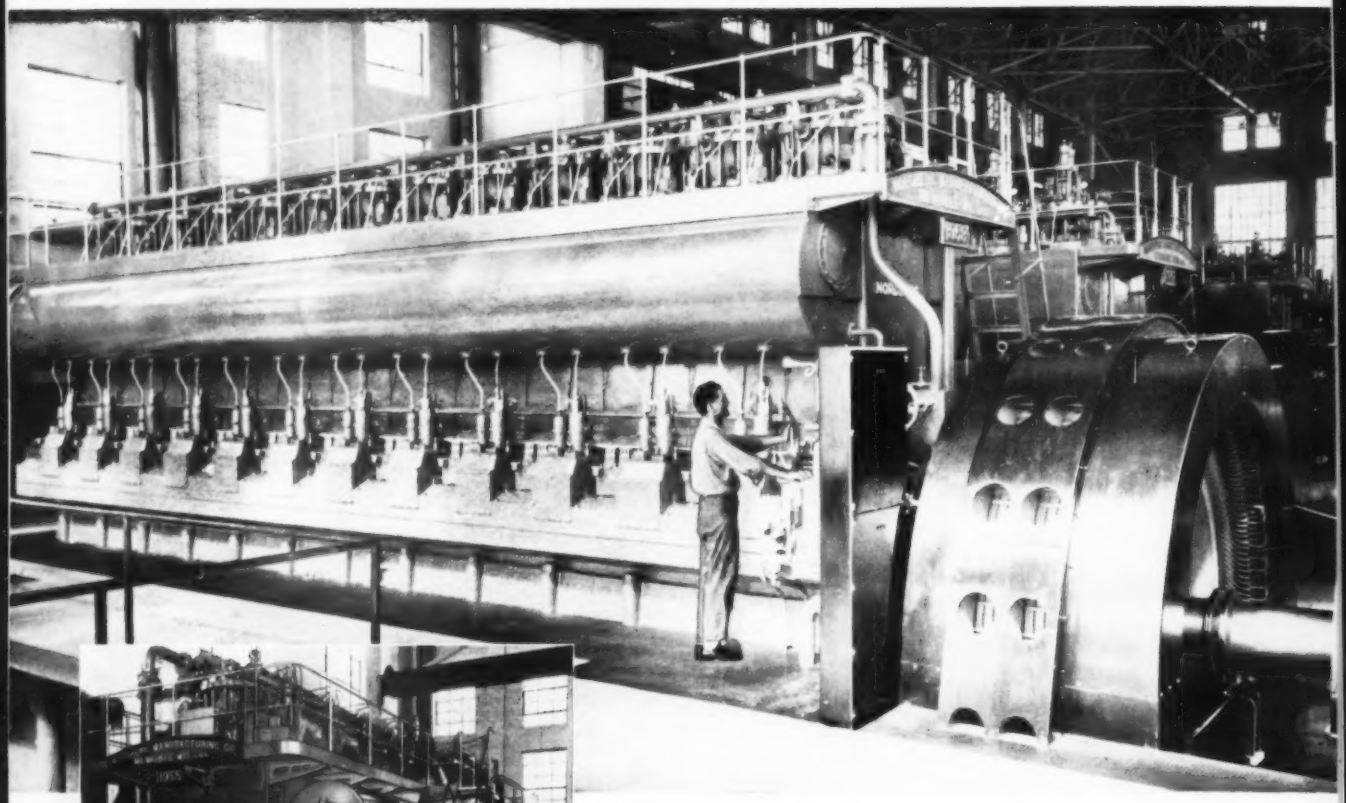
The city had analyzed and evaluated the quality and volume of water supplied by five driven wells that were its only source. It was found that chloride percentages were higher than permissible maximums; that the 118°F temperature demanded cooling and that dissolved solids were as high as 1,137 ppm, also higher than prescribed maximum. In addition, the ground water table was found to have lowered considerably. These deficiencies led to a study of alternate sources by Forrest & Cotton as early as 1949 and a subsequent recommendation that Waxahachie turn to a surface supply. This, at the time, was considered economically unfeasible.

After investigation, the engineers recommended a dam and lake on the South Branch of Waxahachie Creek, which flows some five miles south of the city's business center. Fortunately, topography favored construction of the earthfill dam at the point nearest to the city and construction cost estimates were made, based upon damming the creek, gravity flow to a raw-water pumping station, pressure transmission to a new treatment plant, then gravity flow to the central pumping station serving the distribution system.

The $1,500,000 estimated price tag for the total improvement raised a new obstacle. The Waxahachie debt limit was close at hand, with more than $1,000,000 in revenue bonds for water and sewage improvements outstanding. The town felt it would be impractical to raise water and sewer charges. Formation of a water district remained as the only way to obtain the needed financing.

This solution was proposed to the electorate and approved, and the new Ellis County Water Control and Improvement District #1 was set up to contain the entire city of Waxahachie, with all boundaries coinciding. A water board of five

Why taxpayers vote YES [X] for money-saving diesel power



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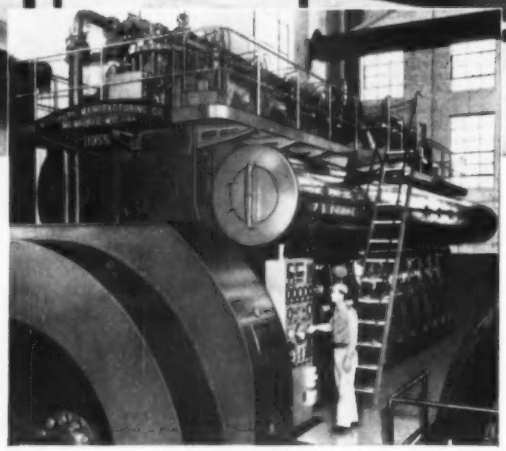

POWER PLANT PROGRESS

1924—First 1250 hp Nordberg Diesel installed at Ponca City.

1926—Second 1250 hp Nordberg Diesel installed at Ponca City.

1928—Two more 1250 hp Nordberg Diesels installed.

1937—2250 hp Nordberg Diesel started (converted to dual fuel in 1947).

1947—2400 hp Nordberg Duafuel engine installed.

1949—3600 hp Nordberg Duafuel unit added, one 1250 hp unit retired.

1952—4275 hp Nordberg Duafuel engine went into service.

1953—5135 hp Nordberg Duafuel installed.

1955—Ponca City's latest addition—10-cylinder, 29" bore x 40" stroke Nordberg Duafuel engine, rated 8500 horsepower.

In Ponca City, Oklahoma . . .

9 NORDBERG ENGINES help make a net profit of almost $1,000,000 a year

The world's largest dual fuel engine is helping the Ponca City, Oklahoma municipal power plant attain new records in production volume, operating economy, and net profits. This 8,500 horsepower Nordberg Duafuel® unit (shown at left), together with eight other Nordberg engines in this notable plant, produced a total of over 55 million kilowatt-hours in the fiscal year ended June 30, 1958, at a total production cost of just 5.67 mills per kwh. *Net profit for the year was over $920,000.00, and net plant profit for 10 years exceeded $7,000,000.00.*

Ponca City and its Light Department owe much to experienced Superintendent of Utilities Pat Schlesinger, who not only directs operations but engineered the big installation. This highly successful municipal plant is a joint achievement, with credit due to Mr. Schlesinger's able staff and to the many present and past city officials who cooperated in the development of this efficient and profitable municipal utility . . . an outstanding example for other municipalities to follow.

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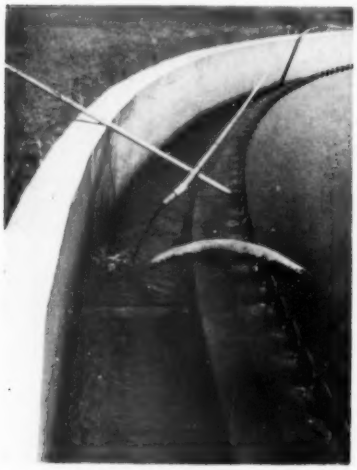
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D. F.

members was elected under a state law governing creation of water districts. With the district formed, a special act of legislature provided for appointment of board members by the city council. The city manager acts as administrator.

The district issued combination tax and revenue bonds to the full extent of the $1,500,000 estimated cost for water improvements, backed by a 5-mill (50 cents per $100 assessed evaluation of property) levy and sale of water to the city.

With financing assured, plans were drawn and the city went to work. During a prolonged dry period, a 4,740-foot-long earthfill dam was constructed, with a 330-foot spillway cut from a white-chalk rock formation at the southern end of the dam. During spillway construction, clearing and grubbing of the back-up area and work on the raw-water intake and pumping station were started.



A siphon from the treatment building brings supplementary carbon slurry to the Dorrco Clariflocculator. The larger line is an agitator which uses water siphoned from the settlement portion of the dual-purpose unit.

Incorporated in the reservoir plan was the use of the 13,500-acre-foot lake (687 surface acres) as a recreational facility. This was included in the plan because the nearest recreational water body of adequate size is Lake Whitney on the Brazos River, about 50 miles away. Fishing, boating and picnicing are important side benefits of Waxahachie's new water supply.

A 20-inch, 3-mile, 6.4-mgd transmission line was connected to the new treatment-plant site, which was located on a hilltop, overlooking the city. The plant provides a 1st-stage nominal capacity of 2,500,000 gallons per day, featuring a Dorrco Clariflocculator (which contains flocculation and clarification in a single tank package), rapid sand filtration, telemetering and central control of most system facilities. A planned second stage will allow treatment of an additional 2.5 mgd, when needed.

When the dam and raw-water pumping station had been completed and the clearing and grubbing was 75% finished, the area was struck by a Texas downpour —that means as much as eight inches of rain in less than 24 hours —and the reservoir was well on its way to full capacity. A previous estimate stretched the filling period over many months, but in a few days, impounded water had forced evacuation of stripping machines and in a fraction of the scheduled filling time the reservoir was at spillway level.

Original treatment studies had indicated a lake source comparatively free of color and odor, and

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They tell us it's a growing America.

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You know already you'll need to expand to keep pace with demand.

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Your W&T representative will help you size your V-notch chlorinator so that when your treatment needs step up—you simply snap in the next size rotameter.

Without buying a new machine, you get the same quick, accurate control in a new working feed range.

And, of course, the right plastics make the whole chlorinator chlorine-proof.

A booklet, "The V-notch Story" will tell you about all the W&T V-notch Chlorinator features. For your copy write Dept. S-133.00

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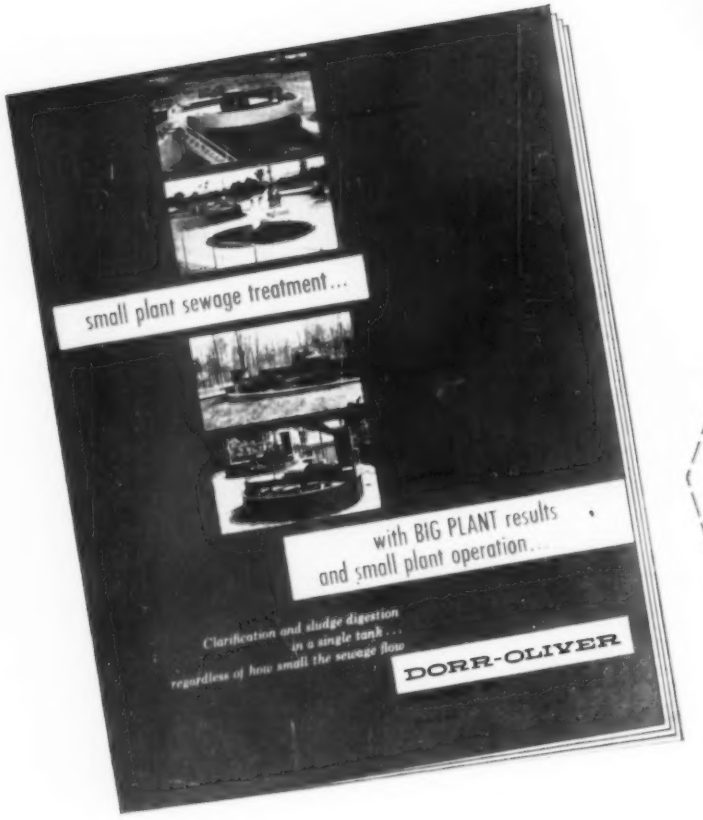
New answers to the problems of

SMALL PLANT SEWAGE TREATMENT


small plant sewage treatment...
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Clarification and sludge digestion in a single tank... regardless of how small the sewage flow
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Just published! A brand-new bulletin on revolutionary new developments in low-cost plants for communities up to 10,000

Sewage treatment plants, with all essential operations performed mechanically and continuously in single, low-cost combination units, now bring the advantages of modern sewage handling methods within reach of even the smallest community.

With only one tank and one drive unit to operate, these new plants overcome the problem of high costs which often make conventional treatment facilities beyond the means of small users. Latest improvements include mechanical grit removal combined with sludge digestion and clarification.

If you're interested in small plant sewage treatment for communities up to 10,000 or even for individual industrial plants, schools, motels or housing developments, you'll want the new bulletin shown above—just off the press! Write for Bulletin No. 6692 to Dorr-Oliver Incorporated, Stamford, Conn.

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WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

design of treatment plant facilities was based upon flash mixing only of lime and ferric sulphate and activated carbon followed by chlorination. But it was not long before organic material left in the inundated section of the reservoir had added many ppm of both color and odor and had created a removal problem.

The built-in plant feature of adding carbon at the flash mixer proved ineffectual, partly because of insufficient detention time and because chlorine dampened the effect of the carbon. Water Superintendent John L. Smith decided that the long transmission line from the raw-water pumping station to the treatment plant would provide necessary detention time if carbon could be added at the influent end of the long line.

The Solution

The first operation introduced was copper sulphate treatment of the lake in order to arrest growth of the algae and other odor-producing organisms.

Then Mr. Smith tackled the problem of adding the carbon at the raw-water pumping station. The water-head at the pumping station averaged about 72 feet—a distinct advantage in the pressure transmission of water to the purification plant—but almost 32 psi of pressure had to be overcome in order to feed a carbon slurry into the line at that point.

The water superintendent started with a 50-gallon steel drum in which the carbon slurry could be mixed, designed an unusual and simple venturi-type water injector to eliminate stirring carbon crystals into the water base of the slurry, provided agitation by a water jet and installed a one-inch rubber suction line leading out of the slurry drum.

He then mounted a ½-horsepower electric motor driving a Fairbanks-Morse 400-gph pump next to the transmission-line pit, tapped the main at the transmission-pump outlet manifold and connected the F-M pump through a one-inch check valve. With the intake end of the small pump connected to the slurry drum, it was possible to overcome line pressure and inject the slurry directly into the transmission main.

Twenty-four-hour attendance was maintained at the usually unattended pumping station to feed carbon to the slurry and to make certain that there is around-the-clock operation of carbon treatment.

The method proved effective, but a trace of odor still remained at the finished-water end of the plant, so Smith placed a duplicate slurry drum unit in the second story of the treatment plant—without the pump—and fed carbon slurry to the outfall end of the Clariflocculator by siphon.

Improved water has resulted, and while traces of odor and color remain, frequent copper sulphate treatment of the reservoir has reduced supplementary carbon treatment to the rare periods when odor and color content are unusually high.

After completion of all contracted phases of water system construction, a substantial amount of bond money remained unspent. Officials suggested additional expenditures for improving the water distribution system and construction of a new elevated water-storage reservoir. The suggestion was put to referendum and voters approved all projected expenditures; consequent-

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You save time and cost because Wisconsin parts for all models are quickly and conveniently available from approximately 2000 Authorized Wisconsin Service Stations *directly* — or supplied by these Service Stations to independent repair shops and original-equipment dealers everywhere.

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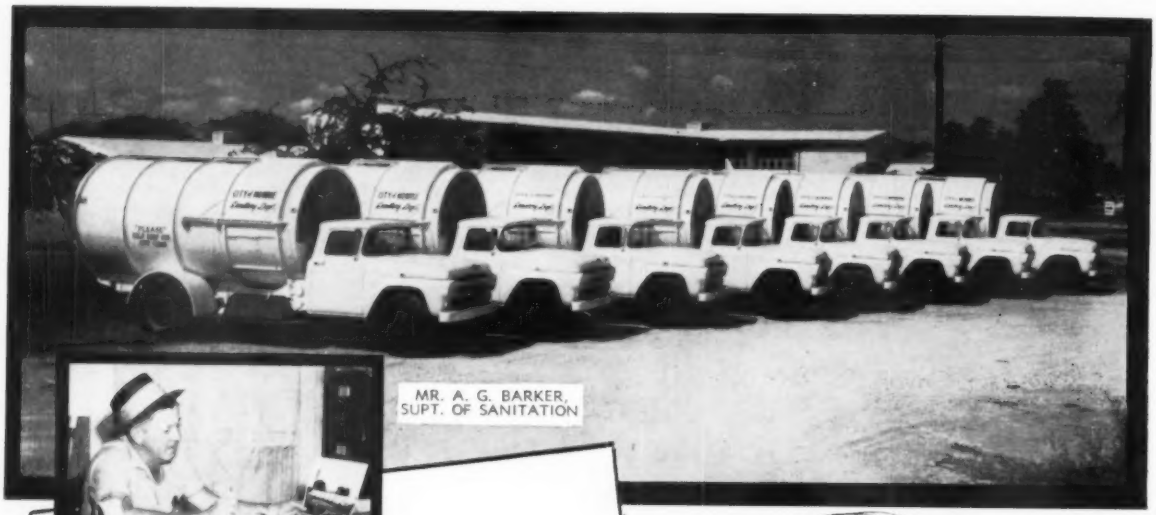

MR. A. G. BARKER,
SUPT. OF SANITATION

OFFICE OF THE MAYOR
MONROE, LOUISIANA

W. L. (JACK) HOWARD
MAYOR

August 27, 1958

Mr. Thomas F. Hopkins
Pak Mor Manufacturing Company
San Antonio, Texas

Dear Tom:

We have recently put our eight new Pak-Mors in operation here in the City of Monroe, Louisiana.

Our eight new sixteen cubic yard bodies are working a full eight hour shift before they are unloaded at the city dump.

We have found that we are moving one and half times more refuse and are covering one-third more territory than previously covered with our ten twelve cubic yard Pak-Mors and eight dump trucks. Of course, our ten twelve cubic yard Pak-Mors are still in service.

Our eight new units have replaced eight of our old dump bed trucks which are shown in the enclosed photographs.

The thing I like about Pak-Mors are their trouble free operation and our lower operating costs and subsequent taxpayer savings.

With kindest personal regards.

Cordially,

CITY OF MONROE, LOUISIANA

A. G. Barker

A. G. Barker
Supt. Sanitation Department

The thing I like about Pak-Mors are their trouble free operation and our lower operating costs and subsequent tax payer savings.

Write for the name and address of your PAK-MOR Distributor

Open bed trucks replaced by Monroe's new PAK-MORs. City fleet of PAK-MORs below. In Louisiana, Southern Equipment & Tractor Co Inc. Sell and Service PAK-MOR Refuse Collection Bodies.

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ly the District disposed of all excess capital by erecting a new 750,000-gallon Pittsburgh-Des Moines Radial Cone elevated tank and installed new distribution mains (mostly 12-inch) and terminal connectors.

The new storage tank floats on the system, improving service pressures and providing a minimum of 450,000 gallons for fire protection.

The first thought, in view of the somewhat inferior quality of the well water, was complete abandonment of driven wells, but further study showed advantages in converting the better wells to auxiliary supply.

By abandoning two of the poorer producers and keeping the remaining three, the city was provided with an assured 1-mgd supply, even with a complete shut-down of the pumping and treatment facilities.

In the event of atomic attack, Waxahachie residents would have a safe, uncontaminated supply, even with the reservoir and treatment plant knocked out by radioactivity. The auxiliary supply would add almost 50% to the total capacity of the lake and filtration plant.

The pumps and wells are operated once a week on a stand-by run to prevent sand-clogging and deterioration of equipment.

The district has turned over (under the special legislation) all operation, maintenance and administration of the system to the City of Waxahachie. The district now exists as a bonding, taxing and financing agency only.

Ask Bids For Composting Phoenix Refuse

Phoenix, Ariz., is asking for proposals from individuals or corporations for the disposal of garbage and trash utilizing the composting proces. The city will agree to the salvage of such items as have resale value and will consider disposal of the tree trunks, limbs and shrubbery by destructive distillation or carbonization in conjunction with a composting operation. The city offers the following points as a guide to anyone interested in submitting a proposal:

1. The city plans to retain garbage and trash collection operations in residential areas. A private company has a franchise to collect refuse in business districts.

2. The composting facilities, including salvage operations, would be constructed with private capital. The city now generates approximately 600 tons of refuse per day. Proposers must certify that they would be able to compost and dispose of at least this amount daily, and the ability to handle 900 tons daily when required.

3. The city would agree to dump the garbage and trash collected by city forces at the composting plants, and would pay the individual or company approximately the amount it now costs the city to operate the landfill. Payment would be computed as a specified sum per ton of refuse hauled and dumped at the plant.

4. Composting facilities must be strategically located insofar as the city's convenience of hauling refuse is concerned.

5. Three composting plant sites not to exceed ten acres would be furnished by the city.

6. The city would expect to participate in the gross or net income of the venture.

Further details and a copy of the invitation to submit proposals may be obtained from Ray W. Wilson, City Manager, City Hall, Phoenix, Ariz.

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ONE INCH
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30 Seconds
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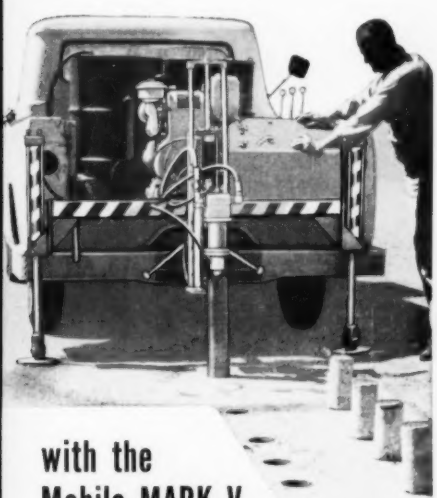

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Mobile MARK V
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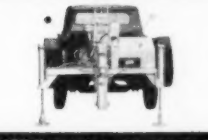
MARK V is available ready-mounted on Mobile custom-designed trailer.



MARK V mounts on any corner with ½-ton minimum capacity.

MARK V hydraulic stabilizers insure perfectly balanced coring.

Hydraulic-powered MARK V is the *one machine designed specifically for production-type concrete testing.* It's the ideal drill for testing companies, municipal and federal agencies, contractors . . . anyone who wants *accurate cores, in quantity, at the lowest possible cost per foot drilled.*

- MARK V 20⅞″ stroke easily extracts smooth, uniform cores from 2″ to 10″ in diameter and up to 18″ in length. Drill head assembly rotates to 90° for angle drilling and highway travel. Compact, self-powered MARK V mounts in minutes on any lightweight truck or trailer. Ask about MARK V custom trailer.
- "Cushioned" hydraulic feed automatically maintains the correct drilling pressure and rate of feed . . . provides exceptional operating ease . . . absorbs drilling vibration to insure up to *one-third longer diamond bit life.*

Write for complete specifications, prices and delivery information . . .

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Public Relation Formula for City Operations

Cincinnati Public Works treats people as customers, gives them good service, adequate information

"Our public relations activity has two basic elements," says Director W. C. Wichmann of the Cincinnati, Ohio, Department of Public Works. "We train our people to give friendly, sympathetic service and assistance to people they contact in any operation. And we utilize all possible means to keep the public informed about what is being done and why."

Arthur D. Bird

This public relations policy, Mr. Wichmann finds, "costs little but brings an immeasurable return in the support, understanding, and good will of taxpayers which we in Cincinnati are proud to claim."

Administrative Engineer Arthur D. Bird surveyed the department's practices and found out how this public relations policy affects the every-day job of the public works department in Cincinnati.

Waste collection: *"We serve and never argue."* Public waste collection could generate plenty of complaints. Instead, this unit treats people as its "customers" and probably enjoys the best public relations of any public works division. First of all, it gives real service. For instance, the "set out" service. A team precedes the collection crew to carry cans from the rear of the residence to the curbs. And collections are on a precise schedule, once-a-week, the same day every week.

Newcomers are informed of collection regulations and pickup times by printed cards. Householders are sent new printed schedules when there is a change and newspaper advertisements and stories also announce any schedule change.

Collectors are specifically instructed not to discuss or argue with householders. All complaints made to the crews or telephoned in are referred to the route foreman who personally investigates and talks with the complainant.

Construction projects: *"We write letters and explain."* In November 1958, Cincinnati started two new procedures in public works construction. They were designed to improve relations with the public in general and with abutting property-owners in particular. The city writes an explanatory letter to the property-owners in the neighborhood of the improvement and holds a pre-award meeting with the low bidder on the project.

The letter frankly outlines the problems involved in the construction, says that there will be inconveniences, and promises that the city and the contractor will try to minimize these. Written on the theory that most difficulties come from lack of information, the letter tells property-owners the name and background of the contractor, when the improvement will start, how long it will take, and gives the name, address, and phone number of the city's inspection engineer for the project.

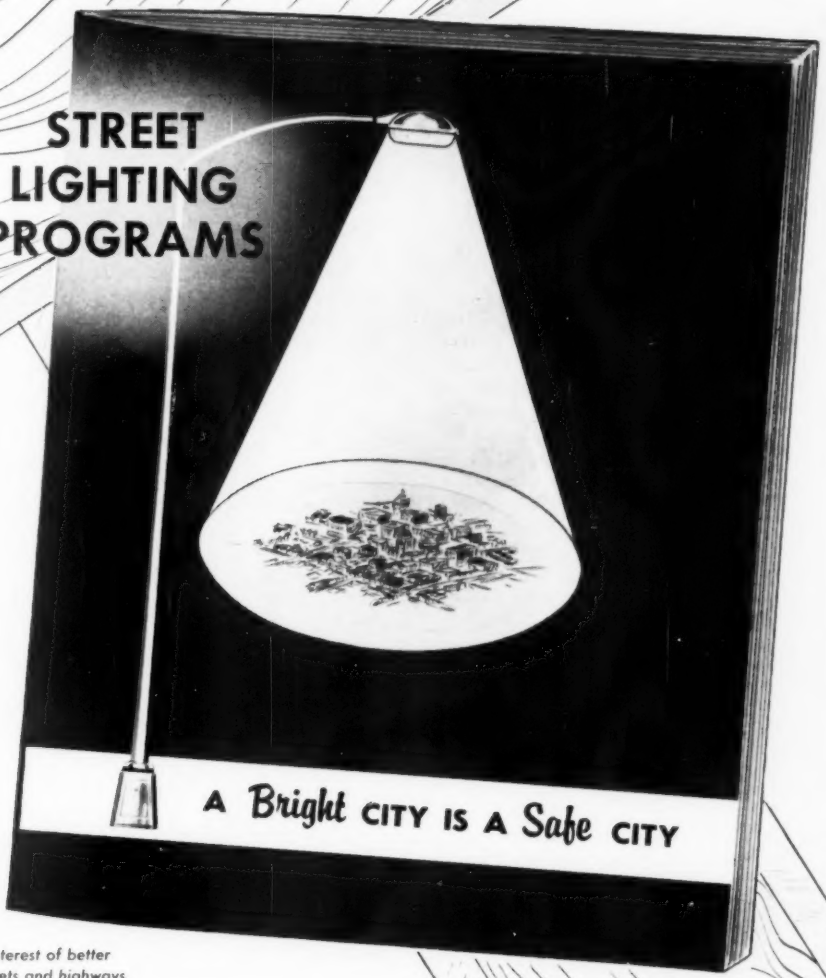
In the pre-award meeting with the low-bidding contractor, the director of public works and the city engineer outline the improvement project, points of city policy, and the importance of good relations with abutting property-owners during the work.

Street resurfacing: *"We calm motorists with signs."* Mechanical resurfacing operations on major thoroughfares inconvenience traffic from several days to several weeks. To minimize complaints and to let

The City of Cincinnati seal was adopted in 1819. The scales symbolize justice; Mercury's staff, commerce; the entwined serpents, wisdom; the sword, power. The city's public works department is endeavoring to make the seal symbolic of service. Its public relations tools to do this are described in this article.

free guide

to Planning and Promoting . . .



Published in the interest of better lighting for our streets and highways

Here is help for those planning street lighting programs. Our new 20-page guide, entitled "A Bright City is a Safe City", contains charts and tables on traffic volume, light intensities, pole spacing, mounting heights and other valuable information. It also describes and illustrates re-lighting programs of specific cities and towns. Just write us—on your letterhead, please—for your copy. Address: Dept. A-3

KERRIGAN
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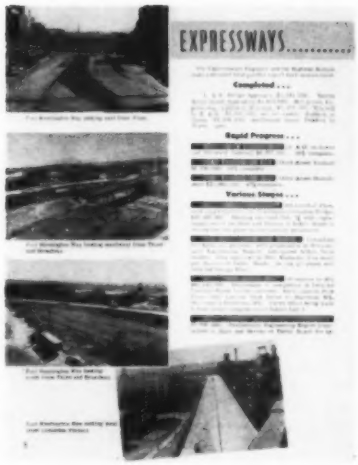
ROCKWELL R STANDARD ®

STREET LIGHTING & TRAFFIC SIGNAL STANDARDS—SIGN STRUCTURES—IN STEEL & ALUMINUM

Construction activity and other public works information goes to 7,000 community leaders in this quarterly general progress report issued by the manager.



Expressway information is given Cincinnatians by newspapers and city publications. Public Works keeps plenty of pictures for such uses.

the people know what the city is doing, Cincinnati uses a standard pedestal sign. The legend tells what work is going on, asks the motorist to be patient, and promises an improved street surface for his enjoyment. In three years of use, the signs have "eliminated many complaints and questions about the traffic tie-ups."

Clearance-for-street-cleaning: "*Our answer is 'in the bag.'*" Nearly every city has the problem of what to do with cars, legally parked in metered spaces, on days when streets are to be cleaned. Moving the cars is a source of irritation to owners and having to move them handicaps work crews.

Cincinnati uses an ordinary brown paper bag with the words, "No parking today, Police Dept." printed in big, red letters on both sides of the bag. By agreement with the police, maintenance crews of the public works department place these bags over parking meters at least ten hours in advance of the clean-up. With this ample advance warning, the police are not reluctant to cite an offending car-owner and haul his vehicle away. This is seldom necessary any more "because nearly all motorists now understand the reasons for the temporary prohibition and appreciate the notification."

Complaints: "*We personally contact the complainant.*" The maintenance division gets many calls and written complaints about hazardous street conditions, inlet or sewer stoppages, street and cellar floodings, etc. Cincinnati religiously follows a policy of personal contact with the complainant. If possible, the field investigation is carried out in the company of the complainant and an attempt is made to solve, or at least come to an understanding about, the problem with him, on the spot.

Expressway headaches: "*We hold weekly meetings; the press reports.*" Cincinnati's $250-million worth of interstate expressway construction is bound to create troublesome problems for many divisions of the city and for citizens whose homes or businesses are affected by the construction. So—at the very beginning, back in 1954—the expressway engineer began holding weekly meetings in the city manager's office. Heads of all agencies involved in the program attend. So do representatives of the local newspapers.

A report of progress is presented, followed by discussion. Coverage of the meetings, according to Director Wichmann, "has resulted in the general acceptance, by the public, of the inevitable inconveniences caused by such extensive construction." The meetings have kept all concerned agencies informed so that "projects have been carried out in an atmosphere of mutual understanding and cooperation."

Sidewalk troubles: "*We created a review board.*" In Cincinnati, abutting property owners must maintain sidewalks but the city is required to see that necessary corrections are made, by the owner or by the city at owner's expense. Complaints—about sidewalk notices and the cost of repair bills—were once referred to a committee of the City Council. The committee was always deluged with complaints and citizens had to wait a long while to be heard.

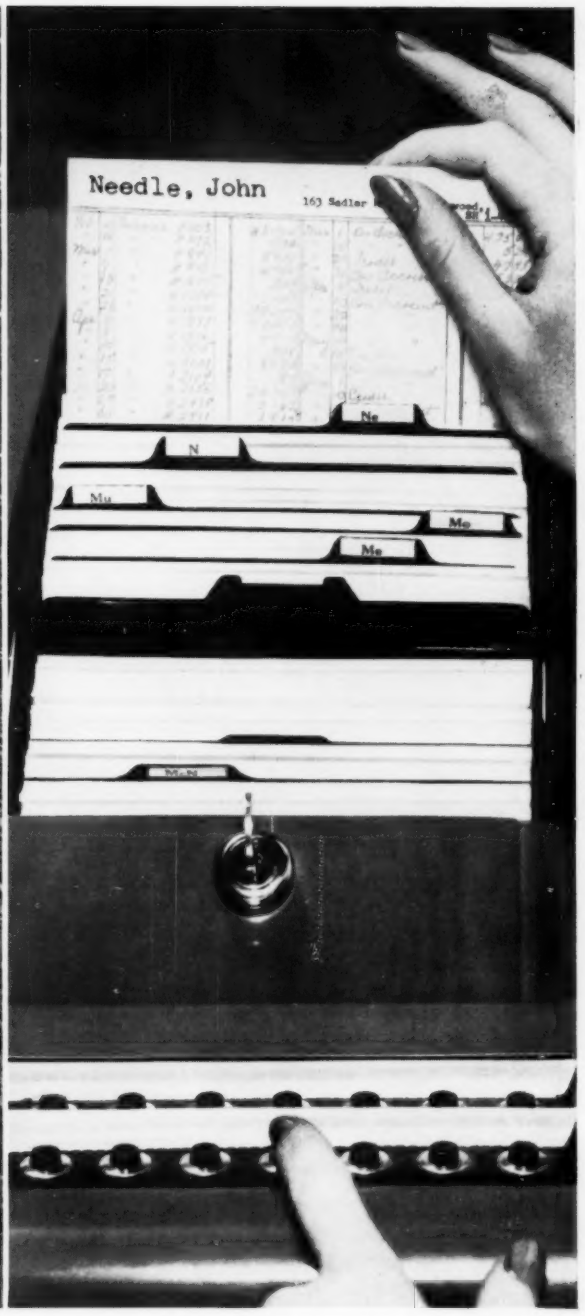
Now a three-man review board: the director of public works, the city engineer, and the assistant city solicitor, with a city sidewalk engineer as secretary, can hear complaints and make settlements in the name of the Council. Results: "Not only has this relieved the council committee, it has actually resulted in increased popular favor, understanding, and acceptance by the general public."

Telling our story: "*We use all the city's information media.*" The Department of Public Works receives considerable attention on Cincinnati's weekly television program, "The City Manager Reports." Frequently one of the public works staff appears with the city manager on this popular, every-Sunday show.

Cincinnati Progress is a quarterly publication going to 7,000 professional and business people, schools, and civic associations. It reports overall activity of the city, including public works. Appropriate space is devoted to public works operations in Cincinnati's annual report which appears as a supplement to one of the local daily newspapers.

Public works officials volunteer as speakers, and are in the listing sent out to secretaries of civic, business and fraternal groups and published in the newspaper as potential speakers to such groups. The Speakers' Bureau has been "very favorably received and has increased public understanding for the Public Works Department as well as for other branches of Cincinnati city government."

EDITOR'S NOTE: Cincinnati's Department of Public Works has also made friends via its safety inspections for motor vehicles and bicycles. This activity was detailed on these pages, September 1959.



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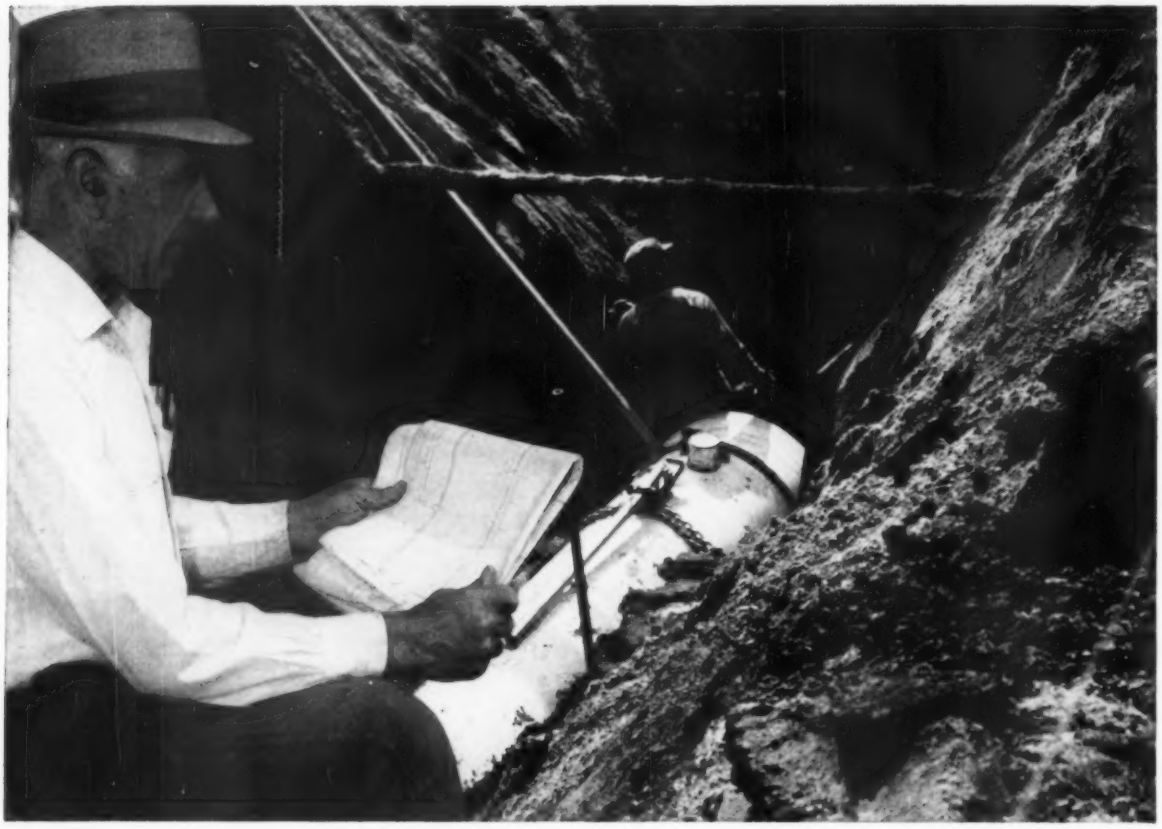
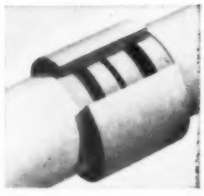


"Not a 'comeback' in 18 years" ...with Transite Sewer Pipe

says Anthony Garcia, President
Allerton Construction Co., New York

"In my eighteen years of installing Transite sewer mains and house laterals, I have never had a 'comeback' because of line failures. Most of the installations have been 100% under water. Therefore, tight joints that stay tight are absolutely essential! For these reasons Transite has always been my choice for sewer line service. I never worry about passing leakage or infiltration tests. I play it safe —with Transite."



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JOHNS-MANVILLE JOHNS MANVILLE JM PRODUCTS

Salary and Wage Scales

. . . that a good water rate should support

Probably the most frequent weakness in water-rate studies is the failure to consider the money that these rates should raise for the payment of operating and management personnel. Even skilled and experienced water-rate analysts have a tendency to overlook this facet of their work. An inadequate wage and salary scale can be as detrimental to a water utility as inadequately-sized pumps and pipe lines.

In any other activity, if a man must supervise equipment costing from $15,000 to $20,000, management insists that the man must be skilled and well paid. When one is dealing with capitalized investments of this nature, any administrator will agree that poorly paid, unskilled help is dangerous.

However, in the water utility field, the city, or the company if it is privately operated, has invested $100,000 for each employee. It makes no sense to hire a man at common-labor wages to supervise $100,000 worth of system and equipment.

Not long ago, a major industrial city was looking for a chemist to take over the laboratory in its new water treatment plant. As any sanitary engineer knows, a skilled chemist in such a plant can save his wages many times over in chemicals alone, not to speak of the improved quality of the water itself. Consultants informed the city that it should be prepared to pay at least $10,000 per year for a qualified chemist to assume these responsibilities. The city council looked apprehensively at this request. "This," said one member, "is more money than we are paying the superintendent and chief engineer." It is not surprising that this new multi-million dollar plant was in trouble, and not performing.

There are many ways that a city can waste the taxpayer's money. Refusing to adopt a salary scale in its water utility that will attract and keep competent, professional employees is one. Regrettably, it is one that is overlooked by sensation-seeking newspapers and over-zealous civic reformers.

A city, and in particular, a city's water works, should be an exemplary employer. The water works is by far the largest business in the community, considering the volume of salable product provided. Its investment is substantial, running between $250 to $300 per person served.[1] The responsibilities are great, and the problems of supply continually aggravate water utilities throughout the nation. Water utilities require good men, and good men rightly deserve commensurate pay.

The rate of pay varies throughout the nation, and probably rightfully so. Nevertheless some comparative guides would be helpful. For example, the manager of a water utility should receive a salary at least equal to that received by the manager of the gas utility, and probably more if he must administer a complex softening and treatment plant. The superintendent and chemist of the treatment plant is a professional man and should be paid in accordance with professional standards. Operators and maintenance men are skilled and their pay should reflect their training when viewed against similar positions elsewhere in the community.

By no means should a city's water works be a hunting ground for every local industry looking for skilled, competent help currently receiving low wages.

When a city reviews its water rate schedules, it should at the same time review the salary schedules that these rates must support. Considering the responsibility that a city places on these employees, the wage and salary schedule should reflect the professional and administrative training and mechanical skills that the work demands.

If it does not, the $100,000 investment that the city has made for each water-works employee it has hired can be expected to run the risk of unnecessary, wasteful depreciation.

If water-rate studies do not include a review of salary scales, they are as deficient as those that do not include capitalized and maintenance costs.

---

[1] "Where We Are and Where We Are Going," Raymond J. Faust, *Willing Water*, February 1959, pp. 3-5. AWWA, 2 Park Ave., N. Y. 16, N. Y.

This is the concluding article in the present water rate series. The first installment appeared in the January 1959 issue. The complete, 15-installment series will appear in reprint form shortly. Watch for the announcement.

ALLIANCE, OHIO

Rates Per Quarter

Cubic Feet		*Per 100 Cubic Feet*
First 1,000	(Minimum)	$4.00
Next 7,000		.25
" 7,000		.21
" 165,000		.16
Excess		.11

Rates outside city limits are 20% additional.

Minimum Quarterly Charges

For all meter sizes ..... $4.00 in city
$4.80 outside

Fire Protection

All fire lines inside and outside city are charged for quarterly at the following rates:

Line Size (in inches)	*Charge*
2	$3.00
3	5.00
4	10.00
6	20.00
8	30.00
10	50.00

Fire hydrants (public and private) inside the city are not charged for. Outside the city hydrants not on fire lines are charged $10 per quarter, whether public or private.

Typical Quarterly Costs

Gallons	*Cubic Feet*	*Charge*
9,000	1,200	$4.50
15,000	2,000	6.50
30,000	4,000	11.50

General Data

Population served 31,000
Miles of mains 98

(Continued on page 169)

In Darling Hydrants

TROUBLE CAN'T COLLECT HERE...→

EVER SINCE modern fire hydrants were invented, designers have aimed, with more or less success, at positive, complete water drainage to prevent freeze-ups, corrosion and binding. And this is another successful feature of major importance in the design of Darling hydrants. Consider . . .

1 An unmatched safety factor is assured by automatically operated, compression type drain valves and unique triple-porting in the main valve seat!

2 For an interval during each opening or closing of the main valve, the drain ports are automatically force-flushed by line pressure to remove any sediment. And, when the main valve is closed, these ports remain fully open to assure the release of all remaining water.

3 The water drains from the barrel through 3 ports into the bronze drain ring which has 10 to 18 ports to allow water to escape into the ground and eliminate all possibility of clogged drains.

This and other equally important Darling design features are your assurance of the smoothest, surest, safest hydrant operation known today. For all details, including the range of types and sizes, ask for Bulletin 5710.

TRADE DARLING MARK

DARLING VALVE & MANUFACTURING CO.

Williamsport 10, Pa.

Manufactured in Canada by The Canada Valve & Hydrant Co., Ltd., Brantford 7, Ont.

Services: Total of 8,642, better than 99% metered
Supply—Impounded reservoir
Treatment—Pre-chlorination, mixing, settling (using lime, alum, and activated carbon), filtration, lime and zeolite softening, and post-chlorination.
Plant capacity ..... 10 mgd
Average demand ..... 6.3 mgd

Remarks

1. Utility provides no part of service lines.
2. Utility provides no part of the cost of new mains except main trunk lines.
3. The Alliance Water and Sewage Department operates and bills for both water and sewer services.
4. Burroughs Sensimatic equipment is used for automatic billing.
5. Water rates were increased by 17% in 1957. Water use was slightly affected; no further adjustment is needed at present.

DONALD D. HEFFLEFINGER
Engineer-Superintendent
Department of Water and Sewage
Alliance, Ohio

CHESTER, PA.

Rates Per Month

Gallons		*Per 1,000 Gallons*
First 25,000	.....	$0.43
Next 225,000	.....	.35
" 2,250,000	.....	.18
Excess	.....	.15

There is no special rate for out-of-town users.

Minimum Monthly Charges

Meter Size (in inches)		*Charge*
$\frac{5}{8}$	.....	$1.00
$\frac{3}{4}$	.....	1.50
1	.....	3.00
$1\frac{1}{2}$	.....	6.00
2	.....	10.50
3	.....	21.00
4	.....	37.50
6	.....	75.00
8	.....	135.00

There is a 2% discount on all bills paid within 10 days.

Fire Protection

Public ..... $35 per hydrant per year
Private: Whether sprinkler, hydrant, or other, charges are based on meter size, on monthly basis, as follows:

Meter Size (in inches)		*Charge*
3	.....	$7.00
4	.....	12.50
6	.....	25.00
8	.....	45.30

Typical Monthly Costs

Gallons	*Cubic Feet*	*Charge*
3,000	400	$1.29
5,000	667	2.15
10,000	1,333	4.30

General Data

Population served	100,000
Miles of mains	274
Services (100% *metered*):	
Domestic	25,916
Commercial	340
Other	252
Supply—Streams	
Treatment—Filtration	
Plant capacity	43 mgd
Average demand	24 mgd

Remarks

1. Utility provides service line to property only.
2. Utility provides 50% of the cost of new main extensions.
3. The Chester Municipal Authority neither operates nor bills for sewer services.
4. Burroughs equipment is used for automatic billing.
5. Water rates were decreased by 28% in 1955. Water use was not affected and further adjustment is not needed at present.

MICHAEL CHURI
Controller
Chester Municipal Authority
Chester, Pennsylvania

EAST LIVERPOOL, OHIO

Rates Per Quarter

Gallons		*Per 1000 Gallons*
First 5,000	..... (Minimum)	$2.75
Next 15,000	.....	.45
" 20,000	.....	.35
" 60,000	.....	.25
" 100,000	.....	.15
Excess	.....	.08

Rates are 10% additional outside city limits.

Minimum Quarterly Charges

For all meter sizes $2.75

Typical Quarterly Costs

Gallons	*Cubic Feet*	*Charge*
9,000	1,200	$4.55
15,000	2,000	7.25
30,000	4,000	13.00

General Data

Population served	30,000
Miles of mains	85
Services: Total of 7,400, 100% metered	
Supply—Ohio River	
Treatment—Filtration	
Plant capacity	6 mgd
Average demand	2¼ mgd

Remarks

1. The utility provides no part of service lines.
2. The utility provides none of the cost of new main extensions.
3. The East Liverpool Division of Water does not operate sewer services, but it bills for them along with the water bill.
4. Burroughs equipment is used for automatic billing.
5. Water rates were increased by 25%

(Continued on page 172)

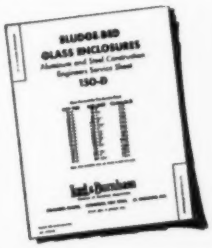
Glass Covers
FOR
SEWAGE TREATMENT PLANTS

LIFETIME ALUMINUM CONSTRUCTION

Now available in lifetime aluminum construction with supporting steel framework. For sludge beds, sprinkling filters, tanks or wherever a glass cover is needed.

WRITE FOR NEW VALUABLE
ENGINEERS' SERVICE SHEETS

Write today for your new set of Engineers' Service Sheets AC-360 containing details, specifications and recommendations for every job request.



Lord & Burnham
DIVISION OF BURNHAM CORPORATION
IRVINGTON, N. Y. DES PLAINES, ILL.

THE MARK OF THE 100-YEAR PIPE

PERMANENTLY YOURS: CAST IRON PIPE

Installed... it stays installed

One thing sure about cast iron pipe—once it's in the ground, it's there for keeps! Over 100 American utilities, having used cast iron pipe steadily for more than a century, can testify to that. And *modern* cast iron pipe gives you greater assurance than ever: great beam strength resists heavy surface traffic; tremendous load resistance absorbs even the most forceful pressures. In fact, when you select cast iron pipe, you can anticipate no major repairs in your water supply system for the next hundred years!

Cement-lined—it stays cement-lined

A smooth coat of cement lining along the inner wall helps prevent the formation of flow-reducing particles. No matter how strong the water is, cast iron pipe always assures a free, steady flow.

Joined—it stays joined

Bottle-tight, rubber-ring joints give you leak-proof protection at the most vulnerable points of your system. Vibrations, surface traffic and washouts present no problem to cast iron pipe. Inherent ruggedness . . . built to perform under all adverse underground conditions . . . repair-free service for at least a century—all good reasons why your choice should be that of water utility experts everywhere. America's greatest water carrier: cast iron pipe.

Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 3440 Prudential Plaza, Chicago 1, Illinois

CAST IRON PIPE

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FULLY
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PIPE DETECTOR

In addition to the famous model "505" Detectron now offers its completely new model "808" with the first circuitry developed specifically for use with transistors. It is NOT merely an adaptation of earlier tube circuits.

Efficient under every known operating condition, effective in varying temperatures, thoroughly proven and trustworthy. Superior performance and reliability guaranteed.

EXCLUSIVE FEATURES

- Detects Deeper by all comparisons
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Written Lifetime Guarantee on CMC parts and workmanship

For specifications and prices, write for File No. AC-3

COMPUTER-MEASUREMENTS CO.
Utilities Instruments Div.
12970 BRADLEY, SYLMAR, CALIF.

in 1955. Water use was not affected and further adjustment is not needed at present.

F. K. Robinson
Superintendent
Board of Public Utilities
Division of Water
East Liverpool, Ohio

FREEPORT, ILL.

Rates Per Month

Cubic Feet	*Per 100 Cubic Feet In City*	*Outside*
First 4,000	$0.40	$0.60
Next 16,000	.22	.33
Excess	.10	.15

Minimum Monthly Charges

Meter Size (in inches)	*Charge In City*	*Outside*
⅝	$0.88	$1.32
¾	1.36	2.04
1	2.32	3.48
1½	5.36	8.04
2	9.92	14.88
3	18.56	27.84
4 and larger	30.96	46.44

A penalty of 10% is added if bill is not paid in 10 days.

Fire Protection

Public: In city, free; a $250 annual charge is made to the rural fire district for water and use of hydrants.
Private: Per hydrant .... $25.00 annually
Per sprinkler head .... .04 "
Per 2" hose connection .. 8.00 "
Per 1½" hose connection 4.50 "

Typical Monthly Costs

Gallons	*Cubic Feet*	*Charge In City*	*Outside*
3,000	400	$1.60	$2.40
5,000	667	2.67	4.00
10,000	1,333	5.33	8.00

General Data

Population served	25,600
Miles of mains	75
Services (100% metered):	
Domestic	7,333
Commercial	280
Other	54

Supply—4 wells
Treatment—Chlorination and filtration
Pumping capacity ..... 12 mgd
Average demand ..... 2.7 mgd

Remarks

1. Utility provides no part of service line but maintains it from the main to the stop box.
2. The costs of new main extensions are charged to the property owner or subdivider and refunds are made as new connections or consumers are added.
3. The Freeport Water and Sewer Departments operate and bill for both water and sewage treatment.
4. Burroughs equipment is used for automatic billing.
5. Water rates were increased by 40% in 1951. Water use was not affected; further adjustment is now needed.

John W. Briggs
Superintendent
Water and Sewage Treatment Departments
Freeport, Illinois

RAMSEY, N. J.

Rates Per Quarter

Gallons	*Per 1000 Gallons*
First 6,000	(Minimum of) $3.00
Next 494,000	.45

Excess established by the Board of Public Works by resolution.

Minimum Quarterly Charges

For all meter sizes $3.90

(Continued on page 175)

BIG JOBS OR SMALL JOBS

There's a WAYNE Sweeper for every municipal need

From freeways to alleyways, from sidewalks to parking lots, there's a Wayne Sweeper for every municipal sweeping need. Wayne offers you the widest selection of sweepers for cities of every size... and many important, exclusive features.

• Sweeper capacities from 3 cu. feet to 4 cu. yards • Sweeping widths from 30 inches to 10 feet • Gas, electric, or LPG power • Many versatile attachments • Sold and serviced in your own area.

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World's largest manufacturer of power sweepers for cities and industry

TWO PIECE
sliding or screw type cast iron valve boxes for covering 4" thru 10" valves for water or gas. Rugged construction for lifetime service. 5¼" shaft. Extensions as required.

Adjustable
VALVE BOXES
THREE PIECE

valve boxes supplied with separate bases are available in sliding or screw type. Made with 5¼" and 7" shafts with extensions as required. Complete line of service and roadway boxes.

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At Public Service Electric and Gas Co., Sewaren, N. J.

Bitumastic coatings resist 11 years of abrasive salt-water attack

Loading docks of Public Service Electric and Gas Company's Sewaren Generating Station are subjected to unusual corrosive attack by the Arthur Kill, a bay-like tidal river between New York and Staten Island. Added to the river's salt water content are floating debris and effluent from industries and oil refineries located along its shores.

To cope with these severe corrosive elements, 11 years ago Public Service's engineers specified that the steel piling for the station's loading docks and sea wall be coated with Bitumastic® No. 50. For added weathering protection, piling exposed above the low-tide level also was given an additional coating of Bituplastic® No. 28.

FOLLOWING 11 YEARS OF EXPOSURE, PUBLIC SERVICE'S ENGINEERS REPORT NO MAJOR RECONDITIONING OF THE PILING HAS BEEN NECESSARY. This utility's experience is not unique: four other installations fronting the Arthur Kill have had similar success with Bitumastic coatings on submerged piling.

The Bitumastic line includes a coating for every industrial corrosion problem. For on-the-job assistance to keep your corrosion costs down, call your nearby Bitumastic distributor or return the coupon. Koppers Company, Inc., Tar Products Division, Pittsburgh 19, Pa. District Offices: Boston, Chicago, Los Angeles, Pittsburgh, New York and Woodward (Birmingham), Ala. In Canada: Koppers Products Ltd., Toronto, Ont.

KOPPERS

KOPPERS
BITUMASTIC
COATINGS & ENAMELS
another fine product of COAL TAR

See our catalog in Sweet's

Koppers Company, Inc., Tar Products Division
Dept. 103C, Pittsburgh 19, Pa

Gentlemen:
Yes, I'd like to know more about Bitumastic Coatings for Corrosion Prevention.

Name_____ Title_____

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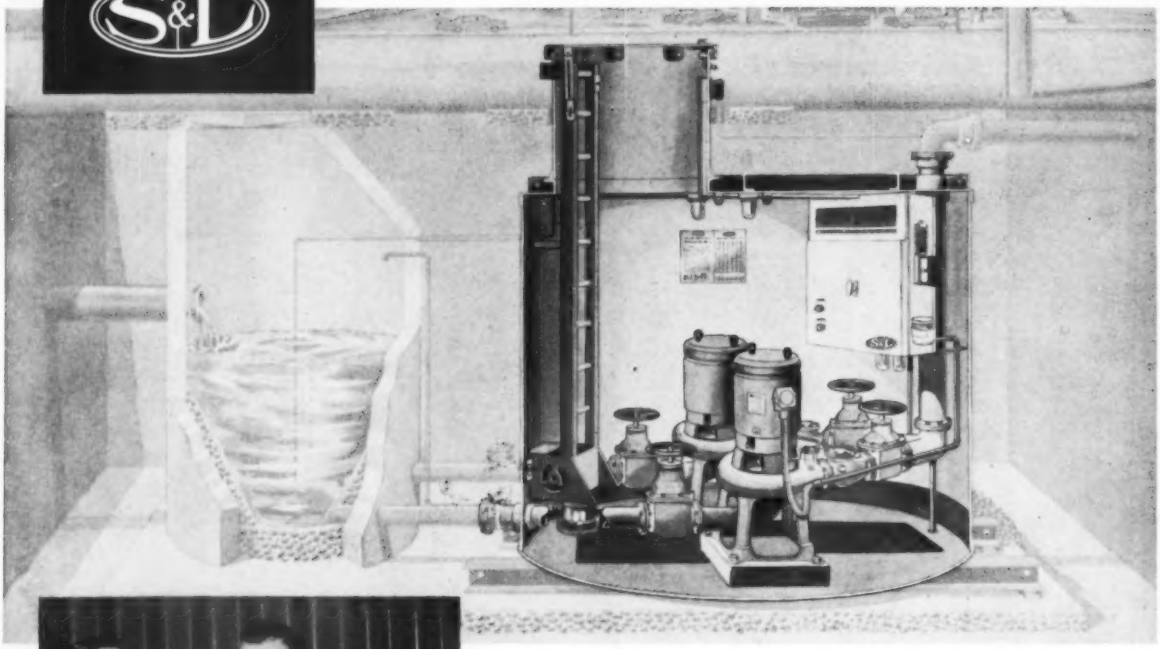
City_____ Zone____ State_____

Specify S&L

Factory-built Quality, Backed by Smith & Loveless Know-how!



The "Exceptional Merit" award in the "Ideas for Home Builders" contest for Smith & Loveless' first industrial movie was presented at the NAHB show, Chicago. Left to right: Larry Winn, Jr., of Winn-Rau Corp., Overland Park, Kas., presents the award to Art Parchen, advertising manager of Smith & Loveless. Looking on is Francis X. Brown, Executive Assistant on the sponsoring Joint Committee, Washington, D. C.

SEE FOR YOURSELF

See the Smith & Loveless motion picture on factory-built sewage lift stations . . . the easy, time-saving way . . . on a special-built continuous projector with built-in screen, right in your own offices. See the operation, design features, complete manufacture and installation of a Smith & Loveless pump station via this color-sound movie. You take a tour of our manufacturing plant in only 20 minutes . . . **Write Today for Details!**

Smith & Loveless Factory-Built Sewage Pump Stations are backed by engineering know-how and manufacturing skill . . . experience gained from more than 1,300 varied installations . . . proven in municipal sewerage systems and suburban developments all over the United States, including Alaska, and Canada . . . **This Month, Our 1,357th Lift Station Is On Our Production Line!** . . . a compact, automatic, easy-to-maintain unit . . . completely factory-built and factory-tested by experts . . . specialists in their field . . . skilled craftsmen, veteran welders and electricians, pipe-fitters and plumbers, inspectors and test specialists . . . each working full-time to build America's finest factory-built sewage lift stations.

The Wide Acceptance of Smith & Loveless Lift Stations Proves Their Merit... The Know-How and Experience Behind Them Proves Their Worth! The things you've come to EXPECT . . . are the things you GET in a Smith & Loveless Factory-Built Sewage Lift Station: top quality workmanship and materials, a product built on service and backed by experience and know-how . . . a quality product, engineered to do the job years and years from now, dependably, efficiently and economically. We've built our entire business on this premise: that we'll be around to make SURE that it does just that!

Write Today For Our Complete Engineering Data Manual on Factory-Built Sewage Lift Stations. Complete 100-page data manual including drawings, specifications, job recommendations on pump stations and pneumatic ejector lift stations. Write Department 10.

2458

S&L Smith & Loveless

DIVISION-UNION TANK CAR COMPANY
P. O. BOX 8884
KANSAS CITY, MISSOURI
Plant: Lenexa, Kansas

Fire Protection

Per hydrant per annum $25.00

A standby charge for sprinkler services is made, as follows:

Service Size (in inches)	*Annual Charge*
2	$50.00
3	100.00
4	200.00
6	300.00
8	400.00
10	500.00

Typical Quarterly Costs

Gallons	*Cubic Feet*	*Charge*
9,000	1,200	$4.35
15,000	2,000	7.05
30,000	4,000	13.80

General Data

Population served 8,500
Miles of mains 40
Services: Total of 2,620, 100% metered
Supply—Wells (storage reservoirs)
Treatment—None
Supply capacity ..... 2.4 mgd
Average demand ..... .6 mgd

Remarks

1. Service lines are provided to property only.
2. Utility provides none of the cost of new mains.
3. Sewer service is provided by private septic tanks.
4. Burroughs Sensimatic equipment is used for automatic billing.
5. Water rates were increased by 50% in 1955. Water use was not affected, and further adjustment is not needed at present.

CHARLES W. MEYERHOFF
Superintendent
Board of Public Works
Ramsey, New Jersey

SPARTA, MICH.

Rates Per Quarter

Cubic Feet		*Per 100 Cubic Feet*
First	2,000	$0.25
Next	2,000	.19
"	2,000	.16
"	69,000	.11
Excess	.....	.08

A service charge of 25 cents per meter is made in addition.

Minimum Quarterly Charges

For all meter sizes $3.75

Typical Quarterly Costs

Gallons	*Cubic Feet*	*Charge*
9,000	1,200 (Min.)	$3.75
15,000	2,000	5.25
30,000	4,000	9.05

General Data

Population served 3,200
Miles of mains 10

Services	*Number*	% *Metered*
Domestic	800	99
Commercial	80	100
Other	12	100

Supply—Wells
Treatment — Zeolite softener, chlorine, fluoride
Plant capacity ..... 1 mgd
Average demand ..... .45 mgd

Remarks

1. The Water Department supplies service line to property line.
2. The Water Department supplies the cost of new main extensions.
3. The Water Department does not operate sewer services but it bills for them along with the water bill.
4. Automatic billing equipment is not used.
5. Water rates were increased by 40% in 1950. Water use was not affected and further adjustment is not needed at present.
6. Sparta makes no charge for fire protection.

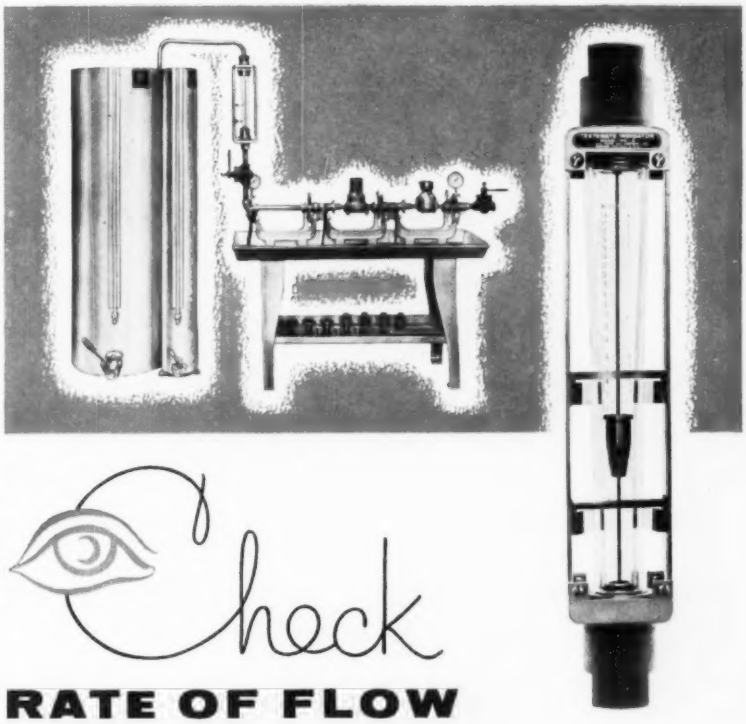
ROY C. BURGETT
Superintendent of Public Works
Sparta, Michigan

FHA Financing for Home Fallout Shelters

Proposed plans to stimulate the construction of fallout shelters in American homes were announced recently by the Office of Civil Defense Mobilization and the Housing and Home Finance Agency.

OCDM Director Leo A. Hoegh and HHFA Administrator Norman P. Mason have agreed that the Federal Housing Administration will encourage building contractors and private individuals to set an example by incorporating shelters in new housing developments, new subdivisions, and model homes.

The program is based upon the decision to make the cost of home shelters an eligible item in determining property values for the purpose of all home mortgage insurance underwritten by the Federal Housing Administration. This has the effect of making FHA financing available for the shelters.



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2. REDUCE BLADING REQUIREMENTS—Compact surfaces resulting from Columbia Calcium Chloride application support traffic loads better; there is less tendency for rutting and the need for re-blading.

3. PROVIDE BETTER BEARING—Columbia Calcium Chloride helps pack well graded mixtures tighter and denser.

4. CONTROL DUST—Columbia Calcium Chloride absorbs moisture from the air to keep road surfaces slightly damp; dust doesn't form.

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An analysis of four adandonment elections that the voters did not support shows . . .

What's Back of Opposition To Council-Manager Goverment

By **BRUCE B. MASON***

In four Illinois cities the voters went to the polls in April 1959 to decide whether to keep council-manager government. They did this primarily because petitions had been circulated and signed by 10% of these voters. The real question, however, is: why did these petitions get circulated in the first place?

The cities were Savanna, Evanston, Wood River, and Peoria. An examination of the elections, plus comments of their respective city managers, gives us some of the reasons, some insight into the groups for and against abandonment and perhaps indicates some thinking about the manager plan. The numerical odds are against most managers being faced with an abandonment election. Since the plan was adopted in Staunton, Va. nearly 50 years ago, it has spread to more than 1,600 communities, and a new profession, city manager, has grown to respectability. Of these 1,600-plus cities and villages, less than 60 or slightly better than 3% have actually abandoned the plan. More, however, have had manager plan abandonment elections. In Illinois, for example, there has been only one abandonment—less than 3% of the total—but more than 10% of the cities and villages have had abandonment elections. It is well to keep in mind, too, that nationally more than 1,600 cities and villages *have abandoned* the other principal forms of municipal government.

Professor Arthur Bromage discovered four main reasons for abandonment in 51 cities that he surveyed: (1) defective charters, (2) economic factors, (3) political conditions, and (4) old charters under new conditions. In addition, he mentions personality conflicts, unfit managers, and outstanding performance under the previous form of government.

Stene and Floro's study of four Midwestern towns that abandoned the manager plan indicated that "*probably the officials and supporters of manager government should look to their own behavior. . . .*" (italics added). Other conclusions were: (1) "All cities evidenced a tendency to associate the manager plan very closely with the person in the office." (2) "With one exception the managers were not previously trained or experienced in that profession." (3) "All of the managers tended to have the engineering outlook. . . ." (4) "Their (the managers') associations tended to place them in a particular economic group, and there was evidence that they were inclined to give less consideration to the views of working classes than to businessmen." (5) "There was criticism of council and (6) domination by one economic group." (7) "There was evidence in all of the cities that the city councils were unable or unwilling to serve effectively as political advisors to the city manager. . . . Failure of the council to reflect the political interests of a community tended to make the manager himself a political issue." (8) "Sometimes work was planned ahead rather well but attention to immediate needs was overlooked. (9) "Defense of the council-manager form was on theoretical grounds while opposition to it was often on personal grounds.

We now turn to the cities of Evanston, Peoria, Savanna, and Wood River and to a look into the campaign in each in terms of the general criteria of Bromage, Stene and Floro. Savanna adopted the manager plan in 1950; the other three cities in 1952. Savanna is a small town (5,000 people), northwest of Chicago, that is largely dominated by businesses oriented towards agriculture but it has received some of the backwash from the metropolitan area, including some of that area's more unsavory elements in time past.

Evanston is a quasi-dormitory community of fairly large proportions in Illinois (75,000). It also is the home of Northwestern University, some suburban office development and medium-sized factories. The intellectual level of Evanston is high; aside from the presence of many "organizational" men who work in Chicago, the University and the schools are generally regarded to be very good. Wood River (10,000 people) is a part of the Mississippi River industrial complex across from St. Louis. It has a high percentage of organized labor stemming from a sizable amount of heavy industry. Peoria is the second largest city in Illinois (115,000 people), and is perhaps the most heterogeneous of the four communities. Two industries play a large role in Peoria, the agricultural implement and heavy equipment industry and the liquor industry. As a consequence there is a large organized union force. At the same time, Peoria is the heart of a large agricultural base. Finally, the Negro community in Peoria is a force to be reckoned with in po-

* Professor Mason is connected with the Institute of Government and Public Affairs, University of Illinois, Urbana, Ill.

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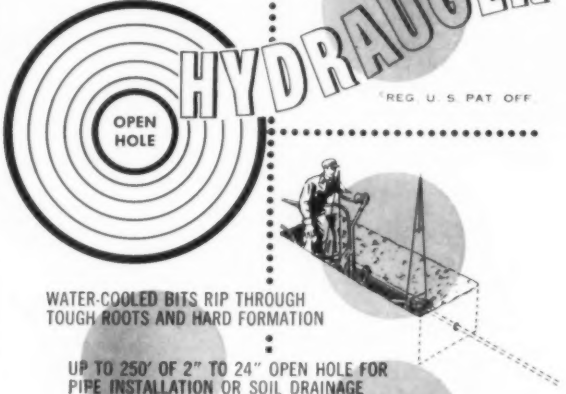

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litical affairs. Of the four communities, only Wood River is consistently Democratic; even Peoria, which might be expected to elect Democrats to office, does not.

Since the Illinois statutes only recently provided for the council-manager plan, all four cities were early converts to the system and all adopted manager government by significant margins: Wood River by 59% to 41%; Peoria by 69% to 31%; Savanna by 65% to 35%; and Evanston by 70% to 30%. Why, in view of the vote totals—which would be the envy of any professional politician—did these four cities have abandonment elections.

Examination of the campaigns in each of the four cities clearly demonstrates that *none* of Bromage's four principal reasons for abandonment played a part. Illinois statutes allow the organization of manager government along the lines that are consistent with theoretical perfection for manager government: nonpartisan, professional control subject to will of elected representatives.

Taxes, services, and expenditures are consistent with a high level of economic development, and are not over-extended or oppressive so that only in Wood River did a critic complain about tax assessments—and this was against township assessment. In Evanston the two major parties supported the manager form of government openly; in the other cities the parties remained discreetly silent. Finally, the charters were as up-to-date as Illinois statutes will allow.

Also, many of the Stene and Floro generalizations were not applicable. In three of the four cities abandonment petitions were presented within a matter of days after the manager took office. All four of the managers were previously trained; none had the engineering outlook. At least one was a student of Stene's.

Most Obvious Reason

The most obvious reason for an abandonment election, and the one which appeals to the managers in question, is that the Illinois statutes make it easy for any malcontent to have an election called. They argue that nearly anyone can get 10% of the voters to sign a petition to do nearly anything.

Another reason for the election in Evanston—with perhaps some influence in the other three cities—may be summed up as municipal "McCarthyism." A significant portion of the "right wing" element in the United States is apparently convinced that all of the professional public administration societies at 1313 East 60th Street in Chicago are subversive, including, of course, the International City Managers' Association. Many people are definitely convinced that the ICMA is more than ordinarily suspect simply because it is "international."

A factor of no mean significance in the abandonment election campaigns was the opposition of the tavern owners. Tavern-owner opposition surely stems from the enforcement of laws concerning closing hours and the sale of alcoholic beverages to minors; it apparently was also a product of the close tie-in between taverns and the blue-collar elements who generally dislike city manager government.

An examination of present voting totals in Peoria, Evanston, and Savanna (Wood River is less conclusive) highlights the fact that lower economic neighborhoods voted heavier for abandonment than high-

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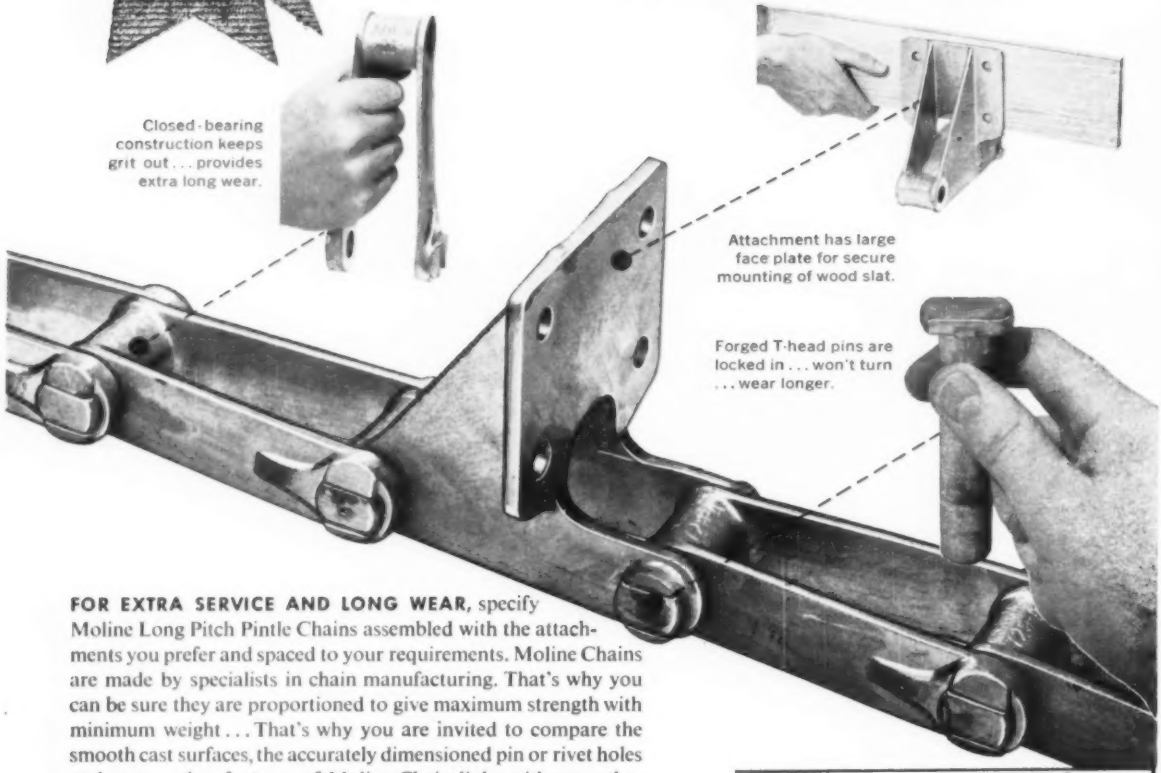
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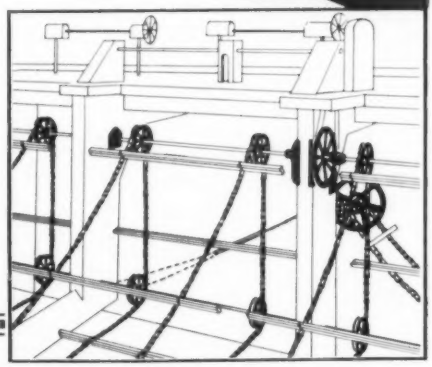

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er. In Peoria, for example, 51 of 115 precincts include the overwhelming majority of lower income voters, including the preponderance of Negroes. Only the fact that such areas consistently turn out lower voting totals makes it appear that the support for manager government is so high. These same areas of lower-income voters are also the strongholds of organized labor which, in the leadership at least, is lukewarm to city manager government. There is a feeling in all of the cities but Evanston, which has ward representation, that at-large council elections work to the disadvantage of the working man and the Negro.

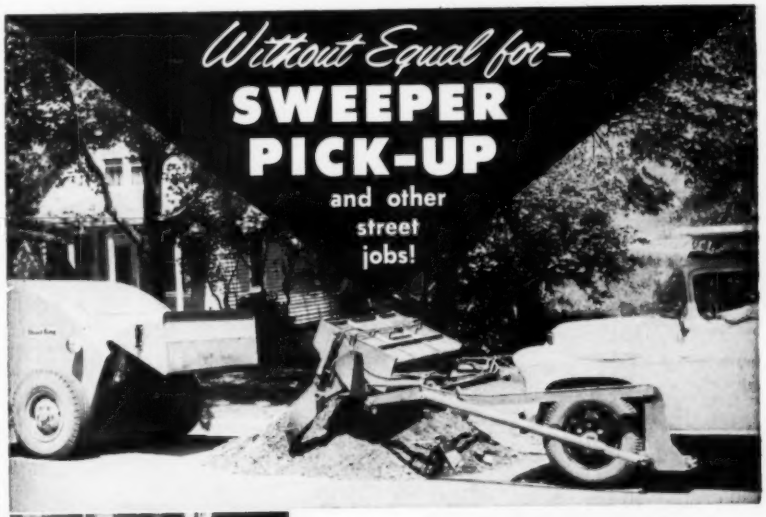
Finally, there was a clearly discernible feeling in all of the communities—again particularly in the working classes—that manager government is aloof; that the manager is representative of the "Jaycee" type; and that the council is not alert to the needs and interests of the people; that, instead, the council is a willing tool in the hands of the manager. To many people, manager government lacks the personal touch or "compassion" that is so prevalent in other forms of local government in the United States.

Two facts about manager government seem obvious: it is predicated on the assumption of a more or less homogeneous society; and it is largely an administrative answer to what are presumed to be largely administrative problems. In some cities these may lead to trouble if regarded as absolutes.

Even if the manager government can go on for years unchallenged, in the name of the democratic ideal as well as the administrative ideal, it would seem that special efforts should be made to provide an accommodation to the perpetual minority. There are several ways of taking into account minority needs without a resort to partisan political elections. One is to provide for council elections on a ward basis, though this was not alone sufficient in Evanston. Another is to set-up human relations councils. (The city managers in Illinois are presently studying the need for councils.)

Still a third way is to channel requests for and decisions concerning administrative actions through councilmen. Such a plan is followed in some cities in Illinois. Care, however, must be taken to insure that the councilman understands that "his" clients are to receive no more than fair play. It is often helpful to provide for minority representation on the council, or, failing that, on the various advisory boards of the city. In order for a Negro, for example, to be elected to the board he may have to be co-opted by the "good government" group. Peoria, shortly after the recent election, had a vacancy on the council to which an outstanding Negro was appointed. One hopes that if he or someone equally qualified from his race can be elected at the next election, it will go a long way towards satisfying the needs that are felt by Negroes in that city.

The lessons in Illinois, then, serve to remind us that government, if it is to be democratic in our society, must be more than a mere administrative response to a societal need, it must take account of the means by which policy is initiated as well as the manner in which it is executed.



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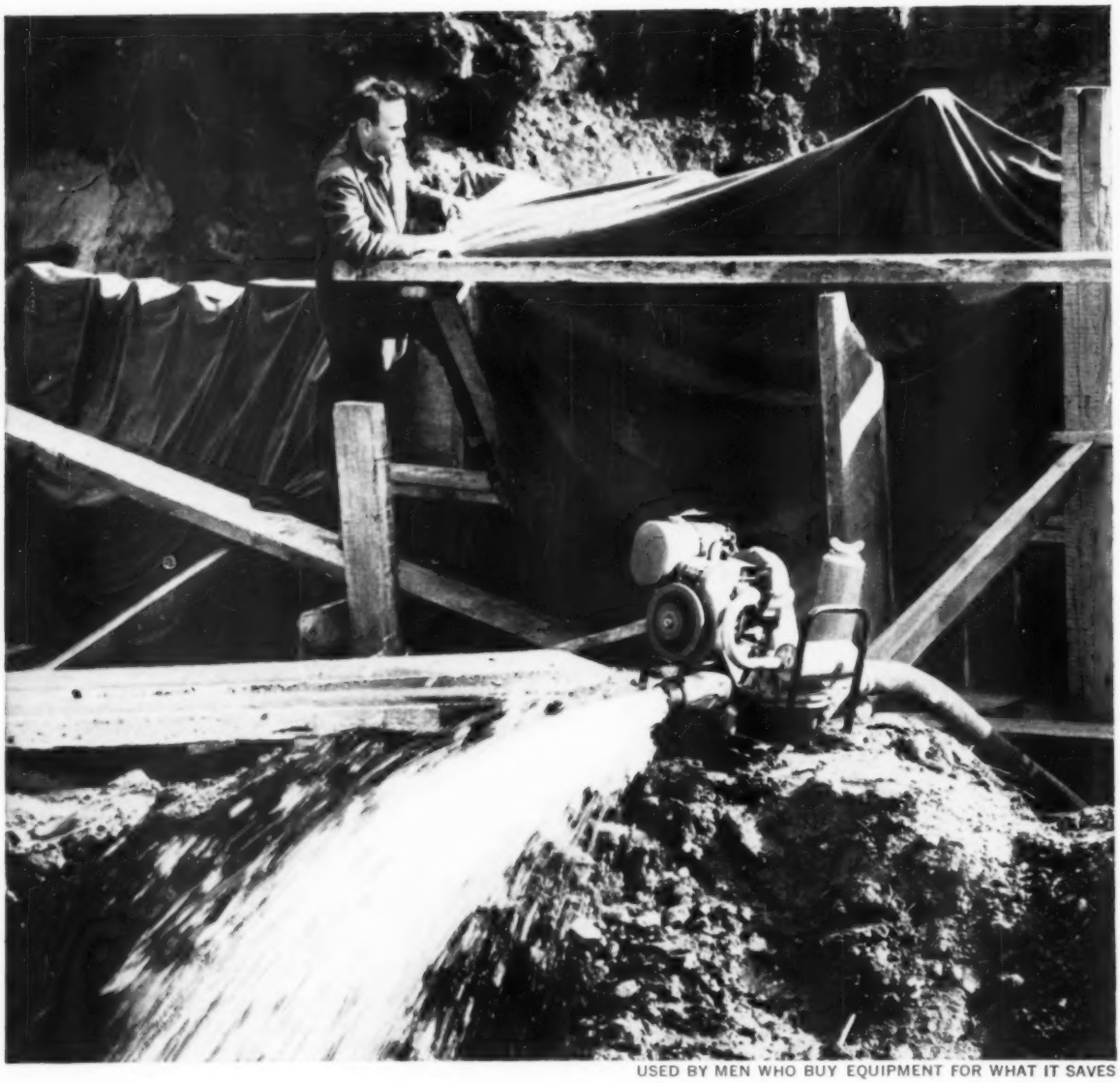

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Current Bids in Tennessee Cities

An 80-page compilation of recent bid data on Tennessee purchases and projects has just been issued by the Municipal Technical Advisory Service Division of University Extension in cooperation with the Tennessee Municipal League.

Its purpose is to assist engineers and city officials in making closer estimates of costs of various public works projects. Estimates that are too low may require the issuance of additional bonds and slow up the project. Estimates too high may quickly cause a much needed facility to be deferred. Both "too low" and "too high" estimates cause unnecessary delays. M. U. Snoderly, the editor of this compilation, recommends caution in data use.

The fields sampled are miscellaneous purchases, and unit bid prices on curbs, pavements, and on gas, sewerage and water-works systems.

In the first category pumping-engine prices are given for six cities: for 750-gpm trucks, $12,962 for Harriman; $12,000 for Johnson City; $14,385 (including a 750-gallon tank instead of the 500-gallon tank in the above two contracts) for Whitwill; $18,500 for Signal Mountain. For 1,000-gpm pumping engines, $19,725 for Jackson; $22,819 for McMinnville.

The Town of Norris (population 1,134), received bids October 1, 1959, on labor and equipment for cleaning ditches and shoulders as follows (per hour): grader with operator $12.50, roller with operator $8.50, dump truck with driver $5.

Units bids on curbs and gutters and on a sanitary sewer and pumping station are included for Nashville (population 176,000). Similar data are given for annexed area sewerage in Chattanooga (143,000 population), costing $227,000. Two small cities reporting costs on good-sized projects are Camden (2,500 population) and Lawrenceburg (6,460 population). The former project is for vitrified concrete outfall sewers costing $85,000 and for a $192,000 sewage treatment plant. The latter is a $444,000 sewage plant.

Linden asks to be counted in with a sewage plant, water plant and collection lines for its 854 people. The bid ranges are interesting; see table.

BID RANGE IN LINDEN, TENN.			
	No. of Bids	*Range of Bids*	*% Range*
Sewage plant	11	$105,000-$127,000	11%
Water works	8	$ 28,000-$ 33,000	12%
Collection lines	10	$195,000-$298,000	53%

Purchasing Procedures In Griffin, Ga.

The dollars the City of Griffin, Ga. (14,000 population), spends each year for supplies and equipment are spent under the eyes of the city commissioners and the city manager.

From paper clips to fire trucks, every purchase must go through the routine of purchasing procedures.

At the city commission meetings the board makes purchase decisions involving large sums. Tabulations of bids are checked to be sure that the city pays lowest prices.

The city commissioners are operating under a policy adopted as a city ordinance in December 1950, making the city manager the purchasing agent. City Manager Jack Langford explains the purchasing policies as follows:

—All purchases up to $100 which were anticipated in the city budget may be handled by the city manager.

—Emergency purchases up to $25 may be authorized by a city department head or director, provided he certifies to the city manager that the purchase was an emergency.

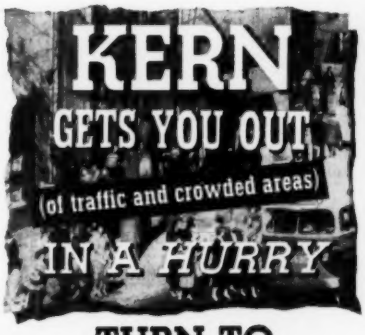
—Purchases between $100 and $1,000 involving budgeted items may be handled by the city manager by getting several bids.

—Any purchase of more than $1,000 requires that bids be submitted and that such purchases be approved by the city commissioners.

—No purchase can be made without approval of the city commissioners if the items or supplies were not included in the city budget.

Thus, the city commissioners have the final say over all city purchases.

Purchases handled by the city manager and involving amounts up



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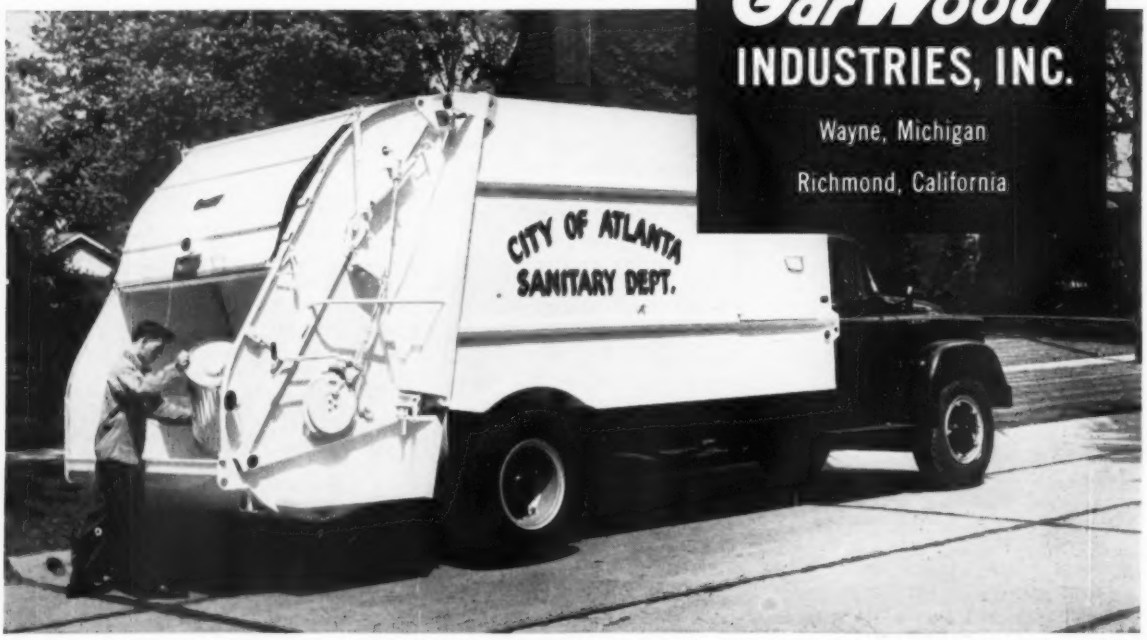

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to $1,000 technically already have been approved in advance by the commissioners when they placed them in the budget.

The city commissioners, Mayor Glenn Bryant, O. M. Snider, Jr. and Carl Pruett, follow the policy of purchasing from Griffin sources whenever possible. "The city wants to trade at home with the people who live here and pay taxes here," the city manager pointed out.

The commissioners each year study carefully the city budget before giving it final approval because when they approve an item, they are okaying its purchase.

Accounting Processes In Monroe County

RAMAC, one of International Business Machines' electronic computors, means Random Access Method of Accounting and Control. Monroe County, N. Y., now has the 305 model.

Taking advantage of this random access ability, the county will handle its appropriation accounting and budgetary control with the electronic system. The machine also will complete in two hours the bi-weekly payroll calculations for 3,500 employees—a job which formerly took 11 hours. It will also handle Monroe County sales-tax accounting for 15,000 retail outlets and the county's accounts-payable operation.

Installation of the versatile electronic-data processing system is the latest step taken by County Manager Clarence A. Smith in a continuous modernization of Monroe County's operating techniques. Monroe is the only county in New York State to have the county-manager form of government and Mr. Smith has held the position since it was instituted in 1936. In that year the county became the first in the nation to mechanize its tax rolls and tax bills, when Mr. Smith began handling them with IBM punched-card equipment.

Lie Detector for Phoenix Police

Receipt of a Keeler Polygraph on December 4, 1959 marked the first the Police Department of Phoenix, Ariz., has owned. Previously the police had used a private lie-detection laboratory. From November 4th to 28th, six policemen were trained in the use of lie-detection equipment.

Off-Street Parking PAYS OFF!

Western Parking Gate in combination with hourly rated "Parkontrol" Time-Dater-Imprinter Equipment.

Over 1400 Western Parking Gates in more than 175 cities have proved that off-street parking can be handled automatically at a substantial profit. Positive control—Western Parking Gates are electrically operated to give complete flexibility, dependability and ease of operation in any city parking facility.

Key, electro-card, coin and token-operated gates, separately or in combination, provide the answer to municipal lots operated on a flat fee arrangement.

"Parkontrol" Time-Dater-Imprinter Equipment available for operations involving hourly rate and validation parking. Low labor costs, low initial equipment cost and simple installation make them a wise investment for any city.

EXCLUSIVE FEATURES—Western, builder of more than 12,000 railroad and highway crossing gates, has engineered the "Lot Full" sign, electric opening and closing treadles, double key controls for night and day parking, electro-cards with period changes, push-button remote controls and automatic counters.

See our eight-page section in Municipal Index 1960

Write for FREE copy of our 40-page manual "How to Lay Out a Parking Lot."

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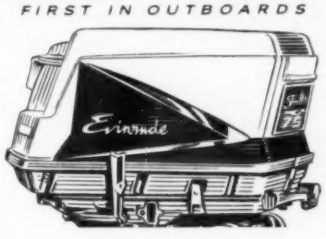

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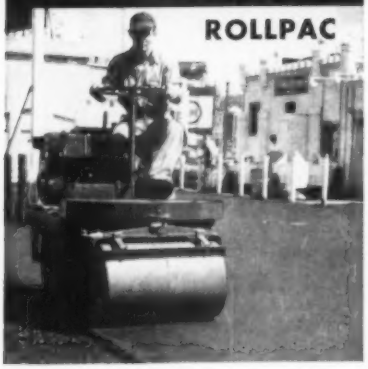

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Federal Planning Grant for "Entire Urban Areas" Only

Expanded planning and related urban aids authorized in the Housing Act of 1959 should be centered on development of the entire urbanized area instead of individual localities, according to U. S. Housing Administrator Norman P. Mason.

Under the 1959 Act federal grants are made available to state planning bodies for planning assistance to towns and counties or groups of adjacent communities with a population of less than 50,000. In addition, planning-grant assistance is available to state, metropolitan, and regional bodies for larger urban and metropolitan areas, including state and interstate comprehensive planning. Federal funds in all cases are matched by state or local funds.

The Act directs that all such grants "shall, to the maximum extent feasible, cover entire urban areas having common or related urban development problems."

To implement this new overall urban policy, Urban Renewal Commissioner David M. Walker has issued procedures for putting the new authority into effect.

Procedures

Under these procedures, states applying for planning assistance for smaller towns and counties will be required to show that such planning will embrace the total urbanized area, including fringe areas and adjoining localities. Metropolitan, state and regional planning proposals must encompass unified planning for the area involved rather than only portions of it.

Such planning, moreover, must cover all the basic essentials for sound urban development, including comprehensive land use studies to guide residential, commercial, and industrial expansion and projections of necessary public works, such as streets, throughways, schools, sewer, water, and recreational facilities for the area's growing requirements.

Under the previous more limited program the Urban Renewal Administration, a constituent of the Housing and Home Finance agency, has already approved more than $3½ million in grants to more than 90 metropolitan, regional, and other area planning bodies. In addition more than $5 million has gone to state bodies for planning in more than 1,000 smaller towns.

"The demand for help in planning urban areas is already sizable," Mr. Mason said. "It is estimated that in the next decade our urban population will increase by another 30 million persons. Unless we prepare now to handle this influx properly, we can destroy the very benefits that urban living offers. Properly directed, urban growth can enrich this way of life. But failure to recognize the urban challenge can undermine it. The result will be muscle-bound metropolises with stranded suburbs, overtaxed to maintain minimum services, with declining central areas which are the prime energy source for employment, cultural, and distribution facilities for the entire area; and with mounting municipal costs and crime and delinquency rates."

Forward urban planning rests on cooperation between local communities and with state governments, Mr. Mason said, rather than in the creation of super-cities.

Along with urban-area planning must go action, Mr. Mason said. Area planning must serve as a basic guide in the specific plans and programs that local jurisdictions undertake in urban renewal and development. Workable programs for local action to prevent and eliminate blight are now in effect in more than one thousand communities, and are a prerequisite for obtaining federal financial aid for specific urban-improvement projects. Federal grants have been approved for carrying out 650 urban-renewal projects, and under the 1959 Act, grants are now authorized to assist localities to map out their urban-renewal plans on a community-wide basis.

Current Grants

Under a total authorization of $20 million, about half of which has been committed, $2 million has been appropriated for urban-planning grants in the current fiscal year. In addition to state, metropolitan, and regional bodies, planning grants may also be made to communities that have suffered major disaster and to planning agencies for areas experiencing rapid urbanization as a result of federal installations.

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Televoice is ideal for agencies or departments where many individuals require dictating facilities. Connects each one to a central transcribing point through a handy dictating phone. Work gets out faster, more economically.

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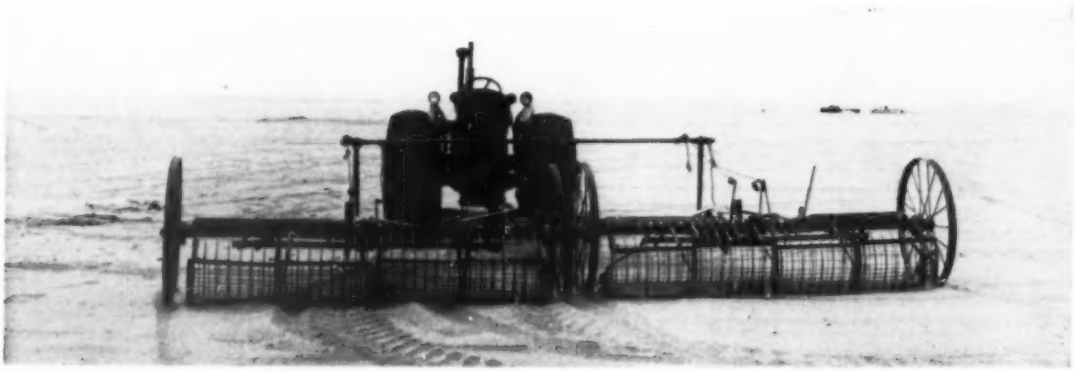


Here is the way the hay-rake beach cleaner looks, ready for action.

We Use a Hay-Rake

. . . to keep beach sand clean and debris-free on five miles of ocean frontage at Long Beach, California

By **WORTH JOHNSON,** Manager
Refuse Collection Division, Long Beach, Calif.

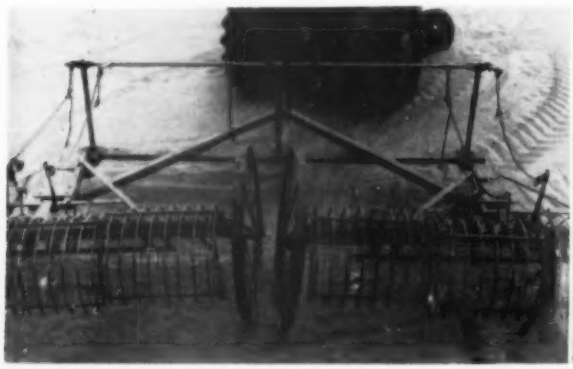
How do you pick 392 acres of beach, including approximately 5 miles of ocean frontage and 4½ miles of bay frontage, clean of the seaborne debris constantly washing ashore and the top-side refuse brought in by an average of 50,000 people daily, with weekend attendance reaching 200,000?

Long Beach has a mechanized answer to this problem, first developed in the late 1930's. Steady development and improvement of the basic idea now enables us to clean the beaches using only one man for every 16 acres. This means keeping the entire area free from papers, bottles, cans and other picnic debris as well as driftwood, seaweed and dead marine life. These same men also must keep several hundreds of beach litter containers empty daily, and keep four parking lots and our large Marine Stadium clean on a seven-day-a-week basis during the summer. One man keeps approximately 21½ acres of main ocean-frontage beach clean on a seven-day-a-week basis. And that means cleaning every foot of every acre every day.

The mechanized answer to this problem came from the farms of the midwest, using equipment that harvests a far more profitable crop, although not one nearly as varied as the daily crop of litter from our beaches. The answer was a hay-rake, modified to be sure, but still basically and recognizably a hay-rake.

Each eight tines of the 32 on the rake are tied together by means of quarter-inch rods which follow the curved contours of the tines and form a 2x1-inch mesh for the top two rows and a 1x1-inch mesh for the bottom eight rows. This screen of rods is welded to each set of eight tines, forming them into one rigid unit. The 32 tines of the rake thus form four such sections, each two feet three inches long.

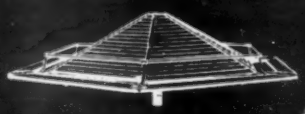
Tension springs run from the tie-



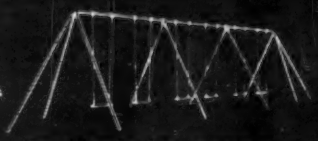
Two rakes are hitched together by this A-frame.

Hay-rake tines are reinforced and formed into a coarse screen.

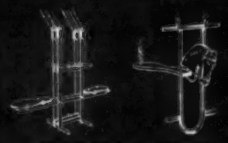
"my grandfather makes the best playground equipment in the whole world because he loves little people like me! he makes slides and swings and see-saws and all kinds of things. they're real strong and they're very safe. if you're going to buy playground things you better talk to my grandfather first. his name is mr. burke."



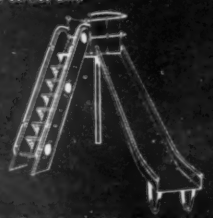
Extra Heavy Duty Merry-Go-Round—4½ o.d. galvanized steel pipe support plus finest select hardwood make this a lifetime service unit.



Rugged Heavy Duty Swing—triangular end pipes plus center pipe supports.

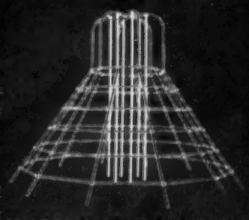


Kiddie Glider and Hobby Horse Swing—self-propelled with maximum safety. Can be assembled with various swing units.



Unique Space Saver Slide—Features bright weather-proof colors over galvanized iron and a stainless steel bedway.

Regulation Offset Basketball Backstop—Safest design in outdoor backstops. Support pipes set back 2½' from play area, 6' apart.



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At No Cost Please send me your complete playground planning and specification file.

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How is this possible? The answer is *simplicity* of design and operation. First, the M-B Packer costs ⅓ less because there is no heavy, complicated hydraulic tailgate involved. A simple, powerful packer plate moves through the entire length of the body compacting all types of refuse — then quickly pushes out the load through the big rear doors. Secondly, the new vertical packer plate design allows up to *4 cu. yds. of useable area above the rated compacted capacity of the body!*

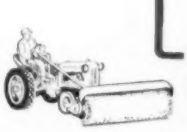
Because of M-B's square, van-type body design which eliminates dead weight, the compactor body can be mounted on a low-cost, popular size truck chassis with resultant savings in lower operating and maintenance costs.

There's a size for every need: 14 to 24 cu. yd. truck mounted; 32 and 38 cu. yd. in both the Trail-Pack, self-powered trailer type models and the M-B Contain-O-Pack Self-Loading Packer system for "containerized" refuse handling.
From every angle, you're dollars ahead with M-B Packer Bodies — the choice of hundreds of private haulers and municipalities.

Money-Making Features

- **FAST OPERATION:** rugged, bulldozer-type packer plate thoroughly compacts refuse, garbage and trash . . . the complete cycle takes only a few seconds.
- **COMPLETE SAFETY** because of side loading from the curb, eliminating danger to collectors from passing traffic. All compaction mechanism located inside the body — safely out of operator's reach.
- **PACKS ANYTHING** — barrels, crates, cartons, etc. without pre-crushing. Use as general purpose truck for hauling snow, ashes, park equipment, nursery stock, leaves, etc.
- **CONTROLLED DUMPING:** full load is pushed out quickly and safely by packer plate *without raising the body* as in hydraulic-type units.
- **LESS DEPRECIATION** — low truck cost, low body cost and less wear and tear adds up to less depreciation of your original investment.
- **MORE BLOCK COVERAGE** — progressive compaction, easy loading means more tonnage per load — fewer trips to the dump or incinerator.

The proof is in a demonstration. See your distributor or write the M-B Corporation, New Holstein, Wisconsin.



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bar of the rake to each of these sections which then maintains its own, independent pressure against the sand so that each section may rise and fall with the contour of the beach. The proper adjustment of these tension springs is the secret to the success of the rake as a beach-cleaning tool.

Small shields are welded at the end of each section and a large shield at the two outermost section ends. These serve to contain the refuse raked out of the beach by the screened tines.

Two such rakes are then hitched in parallel behind a rubber-tired tractor by means of a specially designed "A" frame so that a section of beach approximately 18 feet wide may be raked and cleaned of all debris by one operator. This permits each operator to rake approximately 100 acres per day.

The trip mechanisms of the rakes are altered so that they may be operated by cords from the tractor seat, both rakes being raised and lowered simultaneously.

The sand is fine and powdery, almost silt-like, and this quality permits it to be raked to a depth of at least six inches before any caking or packing conditions are found. The spring tension on each of the eight sections of the double rakes is set to permit just this much "bite" and no more. Consequently, the sand is raked to a depth sufficient to insure the removal of all debris, including that which is partially covered, with little danger of the tines biting into the densely packed, coarser, heavier sand found below six inches. This greatly reduces the maintenance problem of tines broken by too much weight against the screens.

Another key to the success of this operation is the spring "disking." During the winter months the combination of rain and the fact that the beach is not worked causes even this fine sand to pack down.

Still carrying out the farm analogy, before the spring and summer crop of refuse is planted, the sand must be thoroughly disked by a conventional farm disking rig. This works the sand to a depth of four to six inches and restores it to its fine, powdery consistency. Once again, then, the beach is ready to be raked daily to gather its crop of debris.

Some additional details regarding the fine points of this modification of the hay-rake will help to fur-

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Exclusive **KIDDIE TABLE**

Same walk-in design and skid-type feet. A delight for little tots.

- **COMBINATION BENCH 'N TABLE** Converts quickly from 6' bench to 6' table with attached bench.
- **STURDY 4-FT. BENCH** Counter balanced frame of 1⅜" welded steel tubing.

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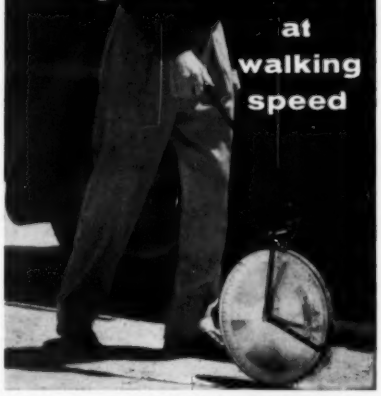

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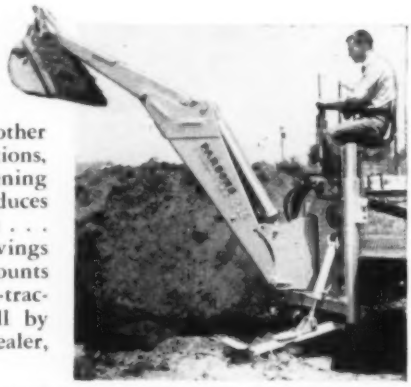

MAIL TO: PARSONS CO., SHAWNEE DEPT., *Newton, Iowa*

☐ *Send literature on the 88-C* ☐ *Have a salesman call*

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Dept. .....

Street .....

City, State .....

AMC 55

PARSONS COMPANY, *Shawnee Dept.*

(A Division of Koehring Co.)

ther explain its adaptation to beach maintenance.

First, a ⅜x3-inch angle iron is welded to the main frame running between the wheels. This provides the necessary additional strength to withstand the weight of the sand in raking and dumping—a weight for which the frame was not originally designed. Additional hinges are added at the ends of the frames for this same reason.

Longer lever arms are welded to the two tripping mechanisms, the one that raises the tines by locking ratchets within the wheels and the former foot mechanism that lowers the tines into raking position. These permit the mechanisms to be tripped from the tractor seat.

The wheels are then reduced in size from the original 54 inch in diameter to 48 inches. This, with the tension springs, permits just the right bite with the screened tines. The undercleaner assembly, including the undercleaner angle, is removed from the factory equipment as this pertains solely to its use as a hay-rake.

The "A" frame used to hitch the two rakes together behind the tractor is entirely constructed in our shops. The distance between the two ball hitches at the wide base of the "A" is a critical distance—exactly 11 feet. The two sides of the "A" are 8 feet 7.3 inches long and form approximately a 67½" angle.

The parallel, three-inch box members running forward from the base of the "A" and joining the box member forming the cross-bar of the "A" at right angles are made of ⅛x3-inch steel. The tongue running from the crossbar to the "A" forward through its apex is six feet four inches long and attaches to the tractor hitch.

The three stands of approximately 1½-inch galvanized pipe protruding upright from the crossbar of the "A" are part of the tripping mechanism. The three shorter arms, each one foot two inches in length, welded to the pipe socketed between the two uprights, connect to the tripping mechanism that locks the ratchets in the wheels, raising the tines. The two longer arms, each 1 foot 7½ inches in length, connect to the other tripping mechanism that lowers the tines. Each of these groups of arms is actuated by cords from the tractor seat and both rakes are raised and lowered together. Present plans call for conversion of this tripping operation to an all-hydraulic mechanism.

In raking, the operator makes

passes from the waterline to a point farthest inland and back toward the waterline, dumping the accumulated refuse and sand at the waterline. On the hard sand it is easier to pick up hard refuse that might easily become buried were the windrows left in the middle of the beach. Then, too, the sand dumped with the refuse at the waterline is washed away by the next incoming tide and replaced with clean sand instead of permitting dirt accumulation, as would be the case if the rakes were dumped mid-beach.

While the tractor drivers are raking the beach either tractor-drawn trailers or four-wheel drive trucks are busy emptying the unique litter containers that are spaced approximately every 100 feet along the beach. Painted an attractive blue and designed to reduce maintenance problems, these containers have contributed much to the task of keeping the beach itself clean and emptying the containers daily encourages their use.

The containers are bottomless, open-topped, four-sided and 30x42x 30 inches high. The elimination of the bottom greatly reduces the principal maintenance problem of rust and in no way reduces the efficiency of the container. The contents are forked out daily by the crews and the container moved a few feet periodically to permit raking and drying the sand beneath.

By the time the loading crews have finished emptying the containers, they are ready to start on windrows at the waterline. Working back along the beach behind the raking crews, they leave a beach that is thoroughly cleaned and ready for the next day.

Thanks to the hay-rake and our beach containers, over four tons of refuse are sifted daily from the sands and forked into trucks from the litter boxes. A big "crop" efficiently harvested daily!

During the summer months a crew of 21 plus one foreman utilize a total of seven tractors, four trucks, three bull-dozers, seven rakes, one disk and two drags. Approximately 140 tons of refuse are hauled from the beach each month by this crew and equipment. It should be borne in mind that, due to the almost total lack of storms during these months and the consequent small proportion of seaborne debris, this figure represents, almost entirely, refuse carried in by visitors.

High tides, when accompanied by

Low, compact 155 digs 10 FEET DEEP

Small in size, big in capacity, Parsons 155 Trenchliner handles everything from mainline extensions to pipe reclamation and residential service connections. Developed especially for city work, this low, compact trencher cuts 16 to 26 inches wide — *at depths to 10 feet* — digs from 5.8 inches to 25 lineal feet per minute.

Operates in congested areas

The 155 works under low-hanging branches, in narrow alleys, between houses, and in other crowded areas, normally inaccessible to trenchers of comparable capacity. Height is only 7 feet-4 inches — width 5 feet-4 inches. It undercuts walks, curbs, cross-pipes — saves hand clean-up — also makes vertical set-ins, flush with foundations. Hinged crumber swings up, out of the way — positive down-crowd boom starts cut fast, holds accurate grade. Want more facts? See your local Parsons distributor or write to us *today*.

The 155's close side-clearance puts trench within 21 inches of fences, poles, walls. Power-shift spoil conveyor dodges side obstructions. Belt-direction is instantly reversible, places spoil bank on either side of trench. Besides ladder-type trenchers, Parsons builds a complete line of crawler-mounted wheel-type trenchers . . . and backhoe-loader attachments for mounting on utility tractors.

mail today **PARSONS Company, Newton, Iowa** *for literature on 155 Trenchliner*

NAME_____ TITLE_____

COMPANY_____ DIV_____

STREET_____

CITY_____ STATE_____

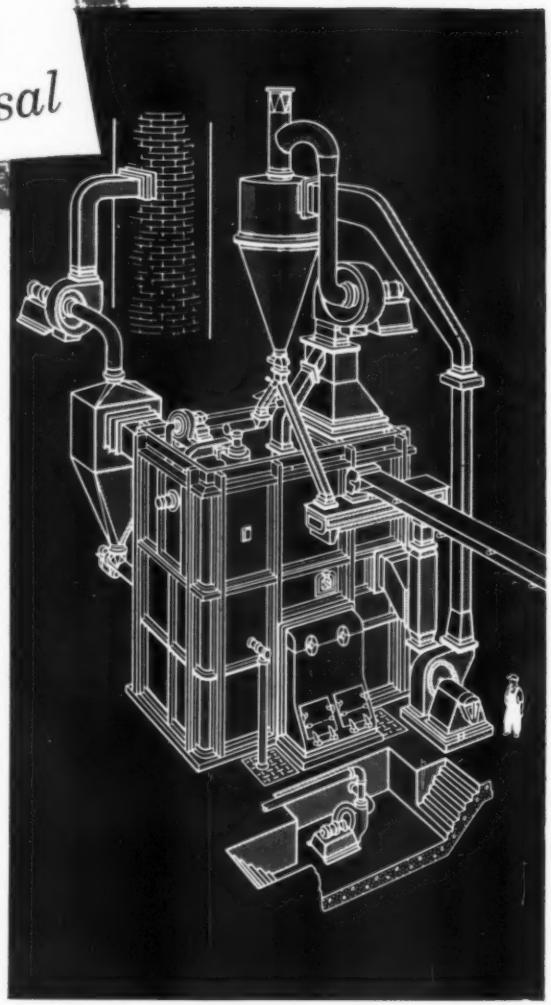
Also interested in ☐ wheel-type Trenchliners ☐ backhoe-loader attachments AMC P16

PARSONS COMPANY (Division of Koehring Co.)

Mfgrs. of: TRENCHLINERS • SHAWNEE® BACKHOES, LOADERS, BLADES

THE C-E RAYMOND FLASH DRYING SYSTEM...

6 reasons why it's your best choice for sludge disposal



IT OFFERS THESE FUNCTIONS:

1. Drying... Only the C-E Raymond System gives you *controlled* drying. This means that your filter cake is reduced to particles uniform in size...low and uniform in moisture content...highly suitable for use as fertilizer when sludge characteristics permit.

2. Incineration... The Raymond System provides the simplest, most efficient method of sludge incineration. It produces a sterile ash that is free of clinkers...requires less purchased fuel.

3. Deodorizing... The C-E Raymond System is the only one that offers high temperature deodorization to remove foul odors from combustion gases, as well as from sludge holding tanks.

WITH THESE FEATURES:

4. Superior Structure... Instead of relying on multiple refractory arches, the C-E Raymond System utilizes small groups of arch bricks individually hung from steel supports above and outside the furnace. This not only makes arch failure virtually impossible, but permits very rapid start-ups and shut-downs... offering important man-hour and fuel savings.

5. Economical Operation... This system has a proved record of low maintenance costs. Not only is maintenance negligible, but the revenue gained from the sale of flash-dried sludge as fertilizer can help pay the operating costs of your plant.

6. Proved Dependability... More than a quarter of a century of use and development in plants throughout the United States and abroad has shown the capability of the C-E Flash Drying System.

More filter cake is dried and/or burned in this system than by all other systems combined.

For detailed information on the C-E Raymond Flash Drying System, and how it can benefit your community, contact the Combustion office nearest you. A C-E specialist will be glad to discuss your requirements with you or your consultants.

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RAYMOND DIVISION, 1132 West Blackhawk St., Chicago 22, Ill.

Eastern Office: 200 Madison Avenue, New York 16, N. Y. • Western Office: 510 West Sixth Street, Los Angeles 14, Cal.

Canada: Combustion Engineering-Superheater Ltd.

C-E

C-107B

ALSO FLASH DRYING AND INCINERATION SYSTEMS FOR INDUSTRIAL WASTE DISPOSAL

heavy ground swells, sometimes bring the surf surging over the beach crest to create lakes on the beach. These potential health and accident hazards are eliminated by bulldozing the natural crest back into the water-filled low area. Tides replace the sand removed, re-establishing the natural crest line.

During the winter months the crew is reduced to eight. Six tractors, two trucks, three bulldozers and four trailers are available to this crew which is responsible for the entire beach. Because of our climate, this is a task of no small proportion. Our mild winters invite considerable beach attendance every month of the year—if not bathers, then sightseers and picnickers. A ratio of one man for each 49 acres of beach, then, maintains and cleans the beach during this period of reduced attendance.

Storms, of course, present totally different problems of beach maintenance. Inland rains wash tons of debris down the flood control channels that empty into the ocean. Heavy timbers, scrap lumber and flood fragments wash down the channels into the ocean to be tossed up on our beach. Of course, this is far heavier than the topside, picnic refuse carried in by our many summer visitors. A typical winter month might run as heavy as 689 tons. During such periods, of course, additional crews and rolling stock must be diverted to the beach and all dozers employed with drag lines to pile and load the heavy debris.

As any beach man knows, the job of maintenance is really a round-the-clock and round-the-year battle with both the elements and the human factor. However, our routine has reduced the problem to an efficiently handled minimum.

Phoenix's Equipment

The number of pieces of equipment in operation owned by the City of Phoenix, Ariz., totaled 1,053 at the end of July 1959, as follows: 250 automobiles (Police Department —105, Fire Department—16, other departments—129); 31 motorcycles, 5 buses, 403 trucks, 33 pieces of fire apparatus, 18 motor scooters, 90 pieces of heavy duty equipment and 226 pieces of miscellaneous equipment (stationary engines, trailers, pumps, sprayers, etc.). The Division of Mechanical Maintenance repairs and maintains all equipment except Fire Department vehicles. The Fire Department operates its own maintenance forces.

How KA-MO drilling method speeds installation of SEWERS...UTILITY POLES...DISTRIBUTION LINES

boring 48′ under highway for distribution line

To run a gas distribution line under main highway, portable Ka-Mo horizontal drilling unit quickly bored 12″ diameter hole, 48′ long, through hard compacted clay. Drill was powered by a 7½ h.p. air motor on standard double-track mounting.

Ka-Mo offers tremendous versatility . . . light, portable drills . . . easy to operate for installing all types distribution lines under streets, highways, railroads. Drills bore through sand, clay, gumbo, frost, shale, limerock, other mineral formations.

6-foot hole every 1½-min.

Drilling a series of holes on a street-lighting project, this Ka-Mo 20″ diameter drill set a fast production pace for pole-erecting crew. Average drilling time per 6-ft. hole — only 1½ minutes! It's hydraulically powered from tractor PTO.

126′ bore inside casing for sewer

Installing sewer under 6 lane divided expressway, this Ka-Mo 26″ horizontal drill bored 126 feet inside casing through hard, compacted clay mixed with boulders. Casing and drill moved forward at the same time providing maximum protection against costly cave-ins.

You'll find the lowest cost answer to your drilling problems in the big Ka-Mo line. Drill sizes: 2″ to 48″ diameter, and larger — in sectionalized lengths — for horizontal, angular or vertical drilling — air, hydraulic, electric, gasoline or diesel-powered. Also — special engineering service any time you need it!

Mail to: KWIK-MIX CO., Ka-Mo Tools Dept., Port Washington, Wis.
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Built to "take it" when the going get tough, the Smith 125 Air Compressor will give you years of low cost, dependable service. The Rugged Hercules Industrial engine delivers over 125 c.f.m. hour after hour, day in and day out.

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- low initial cost
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- 125 c.f.m. at 1165 rpm
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Compare price . . . compare job results—you'll "Go Smith" with "Hardrock Smitty"!

There's also a complete line of Smith Air Compressors in 45 cfm and 75 cfm models, both portable and stationary.

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Douglas Uni-pack provides 6'1" x 28" x 28" single stall booth yet collapses to suitcase size. Easy to carry and set up by any woman election offical. Ideal for augmenting voting facilities during rush periods. Now being used by all regional offices of National Labor Relations Board.

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- Voting Booth Lights
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For free sanitary survey of your premises ask your Dolge service man

Dependable **DOLGE**
WESTPORT, CONNECTICUT

Edited by NORMAN WILLIAMS, Jr.

Comprehensive Plan—Zoning Ordinance Without Mapped Districts

CONNECTICUT. *State of Connecticut* v. *Huntington*, 143 Atlantic (2d) 444 (Supreme Court of Errors (highest court), July 1, 1958).

In 1945 the town of East Lyme adopted a zoning ordinance, the text of which set forth three districts. However, instead of regular zoning maps showing such districts, the ordinance attempted to create "districts" by stating that each lot and building should be classified according to its present use—without drawing any map with zone boundaries; in other words, the purported zoning map was nothing but a land use map, and didn't exist anyway. In 1952 defendant moved into a house in a residence district, and set up a real estate office there, with more (and larger) signs than permitted in residence districts under the 1945 ordinance. In 1954 a zoning ordinance along more conventional lines was adopted by East Lyme. In a prosecution under this ordinance, defendant argued that its establishment was a lawful non-conforming use, since no valid zoning ordinance had been adopted until 1954.

In the opinion, the Court held that the 1945 ordinance could not, under any circumstances, be regarded as in furtherance of a comprehensive plan, as required by law.

> "However, the attempt of the 1945 ordinance to create districts by adopting the uses to which the land was then being put, without any other description of zone boundaries and without regard to considerations other than actual current uses, shows an utter lack of any plan for the orderly development of land uses in the town and renders the regulations pertaining to the uses in the purported districts meaningless."

Delay in Issuing Building Permits During Rezoning

ILLINOIS. *Chicago Title and Trust Company* v. *Village of Palatine*, 160 North Eastern (2d) (Appellate (intermediate) Court, May 18, 1959).

In this case public hearings were being held on a comprehensive zoning amendment at the time when an application was made for a building permit to erect a filling station. The zoning amendment would have prohibited such use of the premises in question. The amendment was passed shortly afterwards, and the property owner brought a lawsuit alleging that the municipal authorities had no right to delay issuing the permit. However, the Illinois court flatly upheld their right to do so.

> "It would be utterly illogical to hold that, after a zoning commission had prepared a comprehensive zoning ordinance or an amendment thereto, which was on file and open to public inspection and upon which public hearings had been held, and while the ordinance was under consideration, any person could by merely filing an application compel the municipality to issue a permit which would allow him to establish a use which he either knew or could have known would be forbidden by the proposed ordinance, and by so doing nullify the entire work of the municipality in endeavoring to carry out the purpose for which the zoning law was enacted. In the case before us it must be assumed that the ordinance prohibited the use of the premises in question for a gasoline station because it was the considered opinion of the municipal authorities that the location of gasoline stations in the area would be harmful to the general welfare of the village. It is worthy of note that in the instant case the ordinance was enacted twenty-four days after the application for a building permit was made by the plaintiffs and that the ordinance was in full force and effect at the time when the order for the writ of mandamus was issued in the trial court."

LAYKOLD TENNIS COURTS

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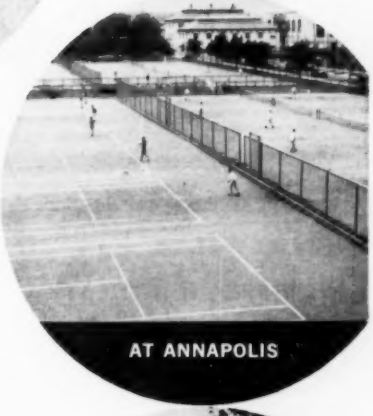
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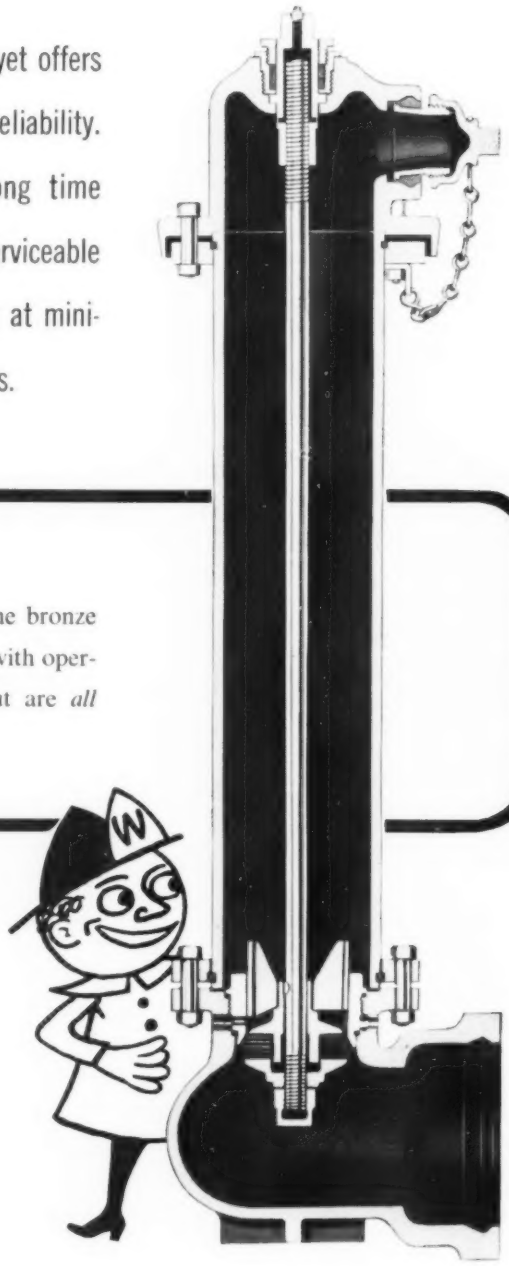

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Every point of friction is protected by at least one bronze surface. This assures against rust and interference with operation. The stuffing box, gland and operating nut are *all bronze*—corrosion-proof!

AND THESE FEATURES, TOO:

Valve opens against water pressure, remains closed in case of accident. Head revolves 360°. Optional break-point flange and breakable stem coupling permit quick repair without excavating. Optional extension piece can be inserted without shutting off water. Available with bell, mechanical joint or flange pipe connections; conventional or "O" ring packings.

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Manufacturers also of Mathews Modernized Hydrants, Mathews Flange Barrel Hydrants, R. D. Wood Gate Valves, and "Sand-Spun" Pipe (centrifugally cast in sand molds)

LEGAL NOTES AND DECISIONS

Prepared by NATIONAL INSTITUTE OF MUNICIPAL LAW OFFICERS, Charles S. Rhyne, General Counsel

Arts and Crafts Center—Proprietary Function

In action for injuries sustained in fall on stairway at municipal arts and crafts center, held city engaged in proprietary venture. *Eversole* v. *City of Columbus*, 158 N.E.2d 515 (Ohio, May 6, 1959) reversing case at 18 M.L.C.D. 37.

Building Permits—Increase in Fees Invalid

In proceeding challenging validity of amendments increasing permit fees under building code, held increased expenses of city government are public problems of community to be defrayed from general revenues and not on fee basis. *Merrelli* v. *City of St. Clair Shores*, 96 N.W.2d 144 (Mich., April 13, 1959)

Contracts—Acceptance of Bid Upheld

Where municipal parking authority advertised for bids to pave site with concrete or bituminous, held authority not required to accept lowest bidder on bituminous materials over lowest bidder for concrete. *Mayer Bros. Const. Co.* v. *Erie Parking Authority*, 149 A.2d 495 (Pa. Super., March 18, 1959)

Policeman—Wages During Disability Recovered

In action by policeman for recovery of wages lost during temporary total disability related to permanent injury previously sustained in course of his duties, held policeman entitled to compensation. *Flaherty* v. *City of McKeesport*, 149 A.2d 537 (Pa. Super. Ct., March 18, 1959)

Subdivision—County Plat Requirements Prevail

Where county ordinance required less area than village regarding minimum area of lots and annexation proceedings affecting property in question was in litigation, held county ordinance prevailed as concerns approval of plat. *State* v. *Village Board of Village of Brown Deer*, 95 N.W.2d 808 (Wis., April 7, 1959)

Tort Liability—Fall From Bleachers—City Not Liable

In action concerning injuries sustained by 6-year-old child when he fell through open space in stands while attending ball game, held city not liable. *Nielsen* v. *City of Sarasota*, 110 So.2d 417 (Fla. App., March 11, 1959)

Tax Exemption—Church Parking Lot

Where church-owned lot adjacent to church edifice was used as parking lot exclusively for people attending services and no income was realized from lot, held such lot was "necessary for enjoyment of place of worship" and exempt from taxation. *Second Church of Christ, etc.* v. *City of Philadelphia*, 151 A.2d 860 (Pa., Super. Ct., June 10, 1959)

Taxation—Rental Tax Does Not Apply To Housing Authority

Held, that excise tax on rentals, levied by statute, was tax imposed on landlord and not tenant and housing authorities did not come within statute. *Green* v. *Panama City Housing Authority*, 110 So.2d 490 (Fla. App., Feb. 24, 1959)

Urban Renewal—Condemnation Opposed

Where owner contended that taking was for private purpose and abuse of redevelopment agency's powers, held refusal of evidence to prove such allegation on ground plaintiff failed to allege fraud against agency was improper and case remanded. *Bahr Corp.* v. *O'Brien*, 149 A.2d 691 (Conn., March 4, 1959)

Urban Renewal—Administrative Remedies Not Exhausted

In action by landowner respecting substandard housing rehabilitation, held owner could not resort to court before invoking and exhausting administrative remedies provided by ordinance. *DePass* v. *City of Spartanburg*, 107 So.2d 350 (S. C., Feb. 9, 1959)

Protect play areas with **REALOCK FENCE**

The giant steelman symbolizes the quality that is built into every section of Realock Fence. Realock is a permanent, low-cost way to enclose school yards, tennis courts, athletic fields, parking areas and other spaces where safety and limited access are desirable.

Realock's symmetrical design blends with the background. And Realock will *not* become "run down" looking because the steel fabric is galvanized *after* weaving to make it weather and corrosion resistant.

Realock Fence is engineered to take punishment. The steel has high strength, yet it is sufficiently resilient to prevent snapping or sagging. Sturdy posts set in concrete provide years of dependable service. Realock is also available in aluminum.

Realock's professional crews can erect your fence, or your own personnel can easily install it. For full details—and a free estimate—call the nearby CF&I sales office.

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CF&I STEEL

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BRANCHES IN ALL KEY CITIES

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RECENT CITY MANAGER APPOINTMENTS

Thomas A. Banfield
Horseheads, N. Y.

Albert J. Falvo
Willard, Ohio

John H. Kennaugh
Wyoming, Mich.

Otis Scroggins
Stigler, Okla.

Robert V. Youkey
Lakeland, Fla.

Fred Davis
Chico, Calif.

GEORGE H. AULL, JR., manager of Lexington, N. C., for the past three years, was recently appointed manager of Durham, N. C., succeeding R. W. Flack, who is retiring. Mr. Aull was previously manager of Elberton, Ga.

THOMAS A. BANFIELD, a businessman in Elmira, N. Y., has been appointed the first village manager of Horseheads, N. Y. Mr. Banfield formerly was manager of Elmira.

RICHARD BARTON, manager of Kingstree, S. C., for the past two years, has been appointed manager of Red Bank-White Oak, Tenn. Mr. Barton has also served as manager of Mt. Pleasant, Tenn.

VIRGIL A. BASGALL, manager of Junction City, Kan., for the past nine years, has been recently appointed manager of Emporia, Kan., succeeding R. W. Cunningham. Mr. Basgall was previously manager of Hays, Kan.

JOHN P. BATCHELDER, formerly manager of Hampton, N. H., for two years, is the new manager of Conway, N. H., succeeding Roy A. Kane. Mr. Batchelder has also served as manager of Parsippany-Troy Hills, N. J.

GORTON JIM BOYD, manager of Holton, Kan., for the past two years, is the new manager of Augusta, Kan., succeeding K. F. Sanborn, now manager of Junction City, Kan. Mr. Boyd formerly served as superintendent of the water department at Chadron, Neb.

FRED DAVIS, director of public works, Chico, Calif., for the past six years, was recently appointed manager of that city, succeeding Robert O. Bailey. Mr. Davis was previously assistant city engineer at Napa, Calif.

WILLIAM V. DONALDSON, administrative assistant of Beverly Hills, Calif., has been appointed the new administratative officer for the City of Montclair, Calif. Mr. Donaldson has also served as superintendent and acting personnel manager for the Denver Water Board.

HENRY DUNN, JR., formerly manager of Mt. Holly, N. C., has been appointed the first manager of Ocean Ridge, Fla. Mr. Dunn was previously an administrative analyst in Dade County, Fla.

ALBERT J. FALVO, manager of Reed City, Mich., for nearly two years, is the first manager of Willard, Ohio. He was formerly public works director of Sharpsville, Pa.

WILLIAM FORMYDUVALL, Bladenton, N. C., has been appointed the new manager of Kingstree, S. C., succeeding Richard Barton. Mr. Formyduvall formerly served as manager of Louisburg and Ayden, N. C.

GORDON A. HOWE, for 12 years chairman of the Board of Supervisors, Monroe County, N. Y., has been appointed manager of that county, succeeding Clarence A. Smith.

JOHN H. KENNAUGH, manager of Buchanan, Mich., for the past three years, was recently appointed manager of Wyoming, Mich., succeeding William Doorn. Mr. Kennaugh was previously assistant manager of Western Springs, Ill.

ROBERT A. KIPP, assistant city manager of Lawrence, Kan., has been appointed as the first manager of Vandalia, Ohio. Mr. Kipp has also served as planning director of Newton, Kan.

ALLEN M. MARKS, manager of Exeter, N. H., for the past three years, has been recently appointed as the first manager of Cape Elizabeth, Me. Mr. Marks was formerly manager of Pittsfield, Me.

DOYLE MILLER, manager of Fontana, Calif., for the past three years, has resigned to become city administrator of Huntington Beach, Calif. Mr. Miller formerly served as manager of Centralia, Mo., and Bountiful City, Utah.

RUSSELL H. NAHM, manager at Apalachicola, Fla., for the past year, was recently appointed manager of Fernandina Beach, Fla., succeeding George M. Hitchcock. Mr. Nahm has also served four years as city commissioner and two years as mayor of DeLand, Fla.

MARSHALL PHARR, administrative assistant of Lubbock, Tex., has been appointed as the first manager of Andrews, Tex.

JOSEPH B. O'BRIEN, engineer for the Borough of Hanover, Pa., has been recently appointed manager of that city, succeeding Robert H. McGregor, newly appointed manager of Painesville, Ohio.

ARCHIE SANBORN, manager of Waldoboro, Me., was recently appointed manager of Bucksport, Me., succeeding the late L. W. O'Connor. Mr. Sanborn previously served as manager of Greenville, Me.

K. F. SANBORN, manager of Augusta, Kan., for the past two and one-half years, is the new manager of Junction City, Kan., succeeding V. A. Basgall, now manager of Emporia, Kan. Mr. Sanborn has also served as manager of Wamego, Kan.

OTIS SCROGGINS, county surveyor of Haskell County, Okla., has been appointed city manager of Stigler, Okla. He succeeds John Wells, who resigned. Mr. Scroggins was connected with the Oklahoma Highway Department for 12 years.

STANLEY SKROCKI, assistant manager of Northampton, Pa., has been appointed manager of that borough, succeeding Hale A. Guss, who has resigned to enter the engineering field. Mr. Skrocki has also served as assistant manager of Gloucester, Mass.

ROGER W. STILWELL, manager of Delaware, Ohio, for the past 3½ years, has been appointed manager of Springfield, Ohio, succeeding Harold R. Cheek. Mr. Stilwell was administrative assistant in Springfield, Ohio, for five years.

ROBERT V. YOUKEY, manager at North Miami, Fla., for the past seven years, was recently appointed manager of Lakeland, Fla., succeeding David O. Payne. Mr. Youkey has also served as engineering administrator for the City of North Miami.

ROBERT B. ZILL, manager of Iron River, Mich., for the past two years, has been appointed manager of Bayside, Wis., succeeding Curtis H. Blyth. Mr. Zill has served as manager of Crystal Falls, Mich., and assistant manager of Marinette, Wis.

ORIN F. NOLTING
Executive Director
International City Managers' Association

Jury Selected for Civic Improvement Award

The jury which will award the Ward Melville Gold Medal for Community Improvement has been selected. Members include:

James Grote Van Derpool, acting dean, School of Architecture, Columbia University; Robert Moses, president, Long Island State Parks Commission; W. S. Foster, editor, THE AMERICAN CITY; Arthur Paar, representing Mr. Ward Melville.

The award honors leadership in bringing cultural, aesthetic and economic values to a local community. (See THE AMERICAN CITY, January 1960, p. 30.)

County Supervisor, Mr. Kenneth Hahn, Departmental Chairman of Recorder's Dept. and Mr. Ray Lee, Recorder of Los Angeles County, compare Recordak Microfilms in jackets with the volumes they replaced.

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originator of modern microfilming

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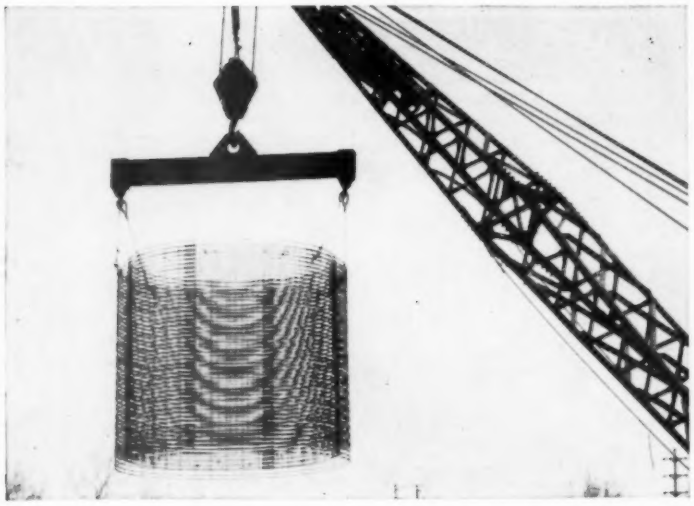
The contractor was able to lay 15 to 20 sections of 8-foot pipe in 8-hour work shifts. This rapid progression indicates the exactness of the sections of concrete pipe furnished to the job. The contractor used care in keeping the trench walls vertical and narrow. Since the load-bearing capacity of the pipe is greatly influenced by the width of the trench, this type of installation is desirable and can be accomplished without special labor or equipment.

Visintine & Company and The Complete General Construction Co., Columbus, Ohio—Contractors

Price Brothers, Columbus, Ohio—Pipe Manufacturers

40-foot depth on Ohio Interstate Highway



The 2 cages of American Welded Wire Fabric are tied together at both the top and bottom with ⅜" diameter stirrups. These stirrups increase the ultimate strength of the pipe and resist diagonal tension at top and bottom sections. If the circumferential steel were not accurately spaced, it would be difficult to place the stirrups in the positions required for best performance. This consideration, plus the over-all economy of using readily fabricated American Welded Wire Fabric, led to its selection.

Over-all view of the trench digging and pipe laying operations. You will notice that the 40-foot trench is open cut using a dragline down to the first level and then a back hoe to the 40-foot level. This sequence of operations enabled the trenching operation to proceed very rapidly. The back hoe digging the final trench provided the extremely straight and narrow trench for best installation.

In Columbus, Ohio, work is progressing on one leg of the important new North-South Freeway. 96" dia. reinforced concrete pipe was specified for a 40-foot depth installation. This was included in one of the largest contracts ever let by the state of Ohio.

The state of Ohio special specifications were followed and each phase of the pipe manufacture and installation was inspected by representatives of the state. The pipe was required to withstand 24,000 # per ft. for the 0.01" crack, and 32,000 # per ft. for the ultimate strength. The actual three-edge bearing test results showed the pipe passed these requirements with flying colors. The 0.01" crack did not appear until 26,000 # per ft., and the ultimate was not reached until the load reached 39,200 # per ft.

Produced by Price Brothers, Columbus, Ohio, the 8-foot sections of pipe with an 8½" wall of 5,000-lb. concrete, were constructed with two reinforcing cages of USS American Welded Wire Fabric. The outside cage is style 2" x 8"—0.4375" x 5 gauge and the inside cage is style 2" x 8"—0.505" x 5 gauge. More than 400 stirrups were positioned between the fabric cages for each 8-foot section to increase the resistance to diagonal tension and improve the pipe's ultimate strength.

The production of concrete pipe is closely controlled and numerous tests are conducted to assure design strength. High quality reinforcing steel is an essential ingredient for top-quality pipe. That is why USS American Welded Wire Fabric was chosen to reinforce the concrete pipe for this job. It is machine-made by electrically welding high tensile strength steel wires made to exacting specifications. The guaranteed minimum yield point is 60,000 psi and the guaranteed ultimate strength is 75,000 psi. All members are spaced to the close tolerances of plus or minus ¼" on centers. Because of the accurate machine prefabrication of USS American Welded Wire Fabric the two concentric cages can be formed faster.

Complete technical information on USS American Welded Wire Fabric is available. Just write to American Steel & Wire, Dept. 0115, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

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"Now with our patching unit consisting of the 1½ ton dump truck, an Essick 120 gallon Truck Mounted Emulsion Unit, a propane torch, and the Essick VR-28-W Vibrating Compactor, the patch life has been tremendously extended, our maintenance production has tripled, and our costs have decreased 80%.

"The Essick VR-28 really solved the patch problem for us."

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CONVENTIONS – WHEN AND WHERE

Conventions listed this month for the first time are indicated by an asterisk (*)

March 6-12—San Francisco, Calif.
AMERICAN CONCRETE PIPE ASSOCIATION. Annual Convention (The Fairmont Hotel). Managing Dir., Howard F. Peckworth, 228 N. LaSalle St., Chicago 1, Ill.

***March 14-15—New Orleans, La.**
AMERICAN BRIDGE, TUNNEL AND TURNPIKE ASSOC. Workshop Conference (Sheraton-Charles Hotel). Exec. Sec., J. Allyn Stearns, American Bridge, Tunnel and Turnpike Assoc., Inc., P. O. Box 748, White Plains, N. Y.

March 16-18—Chicago, Ill.
AMERICAN WATER WORKS ASSOC.—Illinois Section. Annual Meeting (Pick-Congress Hotel). Sec., Dewey W. Johnson, Cast Iron Pipe Research Assoc., 3440 Prudential Plaza, Chicago 1, Ill.

March 16-18—Little Rock, Ark.
ARKANSAS WATER & SEWAGE CONFERENCE. Annual Meeting (Marion Hotel). Sec., C. W. Oxford, College of Engineering, Univ. of Ark., Fayetteville, Ark.

March 20-23—Savannah, Ga.
AMERICAN WATER WORKS ASSOC.—Southeastern Section. Annual Meeting (De Soto Hotel). Sec.-Treas., N. M. de Jarnette, 309 State Office Bldg., Atlanta 3, Ga.

March 21-24—San Francisco, Calif.
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA. Annual Convention (Masonic Temple). Exec. Dir., James D. Marshall, 20th & E Sts., N.W., Wash 6, D. C.

March 23-25—Corvallis, Ore.
NORTHWEST HIGHWAY ENGINEERING CONFERENCE. First meeting of the combined Conference on Road Building and Northwest Traffic Engineering Conference. (Oregon State College). Sec., Martin P. Coopey, Apperson Hall, Oregon State College, Corvallis, Ore.

March 29-April 1—Philadelphia, Pa.
ASSOCIATION OF HIGHWAY OFFICIALS OF THE NORTH ATLANTIC STATES. Annual Meeting (Bellevue-Stratford Hotel). Exec. Sec., Kenneth D. Rice, 1035 Parkway Ave., Trenton, N. J.

March 30-April 1—Atlantic City, N. J.
NEW JERSEY SEWAGE & INDUSTRIAL WASTES ASSOC. Annual Meeting (The Traymore Hotel). Sec.-Treas., Michael S. Kachorsky, P. O. Box 68, Manville, N. J.

April 5-7—Binghamton, N. Y.
AMERICAN WATER WORKS ASSOC.—New York Section. Spring Meeting (Sheraton Inn). Sec., Kimball Blanchard, Neptune Meter Co., 22-22 Jackson Ave., Long Island City, N. Y.

***April 7-8—Raleigh, N. C.**
SOUTHERN MUNICIPAL AND INDUSTRIAL WASTE CONFERENCE. Annual Meeting (North Carolina State College Union). Chairman, Charles Smallwood, Jr., Mann Hall, North Carolina State College, Raleigh, N. C.

April 12-15—Los Angeles, Calif.
AMERICAN SOCIETY FOR PUBLIC ADMINISTRATION. Annual Meeting (University of Southern California). Exec. Dir., Robert J. M. Matteson, 6042 Kimbark Ave., Chicago 37, Ill.

April 18-21—Lafayette, Ind.
PURDUE ROAD SCHOOL. Annual Session (Memorial Center, Purdue Univ.). Sec., J. F. McLaughlin, School of Civil Engineering, Purdue Univ., Lafayette, Ind.

April 20-22—Lincoln, Neb.
AMERICAN WATER WORKS ASSOC.—Nebraska Section. Annual Meeting (Cornhusker Hotel). Sec., J. J. Rossbach, Jr., Metropolitan Utilities District, 3906 N. 48th St., Omaha, Neb.

April 20-22—Emporia, Kans.
AMERICAN WATER WORKS ASSOC.—Kansas Section. Annual Meeting (Broadview Hotel). Sec., H. W. Badley, Neptune Meter Co., 119 W. Cloud, Salina, Kans.

April 22-24—Emporia, Kans.
KANSAS SEWAGE & INDUSTRIAL WASTES ASSOC. Annual Meeting (Broadview Hotel). Sec., H. W. Badley, Neptune Meter Co., 119 W. Cloud, Salina, Kans.

April 24-27—Buffalo, N. Y.
AMERICAN WATER WORKS ASSOC.—Canadian Section. Annual Meeting (Statler Hotel). Sec.-Treas., Dr. A. E. Berry, 72 Grenville St., Toronto, Canada.

(Continued on page 207)

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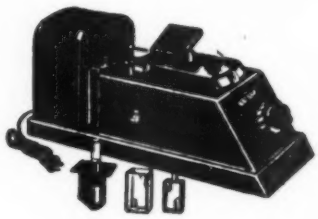

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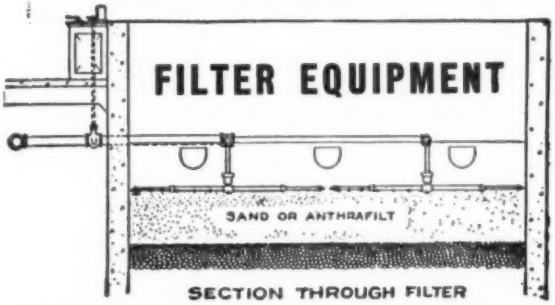

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(Continued from page 205)

April 24-27—Charleston, S. C.

NATIONAL ASSOC. OF HOUSING & REDEVELOPMENT OFFICIALS—Southeastern Regional Council. Annual Meeting (Francis Marion Hotel). For information: National Assoc. of Housing & Redevelopment Officials, 1313 E. 60th St., Chicago 37, Ill.

April 27-30—Berkeley, Calif.

CALIFORNIA SEWAGE & INDUSTRIAL WASTES ASSOC. Annual Meeting (Hotel Claremont). Sec.-Treas., Alfred D. Leipzig, c/o Hyperion Treatment Plant, 12000 Vista del Mar, Venice, Calif.

April 28-30—Billings, Mont.

AMERICAN WATER WORKS ASSOC.—Montana Section and MONTANA SEWAGE & INDUSTRIAL WASTES ASSOC. Joint Meeting (Northern Hotel). Sec.-Treas., A. W. Clarkson, c/o State Board of Health, Helena, Mont.

April 28-30—Tucson, Ariz.

ARIZONA SEWAGE AND WATER WORKS ASSOC. and AMERICAN WATER WORKS ASSOC.—Arizona Section. Joint Meeting (Pioneer Hotel). Sec., A. D. Cox, 2612 N. 16th St., Phoenix, Ariz.

May 3-5—Washington, D. C.

AMERICAN PUBLIC POWER ASSOC. Annual Meeting (Hotel Shoreham). Gen. Mgr., Alex Radin, American Public Power Assoc., Suite 830, 919 18th St. N.W., Wash. 6, D. C.

May 3-5—Lafayette, Ind.

PURDUE INDUSTRIAL WASTE CONFERENCE. Annual Meeting (Purdue University). Sec., Don E. Bloodgood, Civil Engineering Bldg., Purdue Univ., Lafayette, Ind.

***May 4-6—Portland, Ore.**

AMERICAN WATER WORKS ASSOC.—Pacific N.W. Section. Annual Meeting (Benson Hotel). Sec., F. D. Jones, W. 2108 Maxwell Ave., Spokane 11, Wash.

May 10-12—Washington, D. C.

NATIONAL HIGHWAY USERS' CONFERENCE. Biennial Convention (Mayflower Hotel) Dir., Arthur C. Butler, 966 National Press Bldg., Wash., D. C.

May 10-14—Chicago, Ill.

INTERNATIONAL MUNICIPAL CONFERENCE. Joint Meeting of the United States Conference of Mayors and the Canadian Federation of Mayors & Municipalities (Conrad Hilton). Exec. Dir., Harry R. Betters, 1707 H Street N.W., Washington 6, D. C.

***May 11-13—Wenatchee, Wash.**

ASSOCIATION OF WASHINGTON CITIES. Annual Convention (Cascadian and Columbian Hotels). Exec. Sec., Chester Biesen, 250 Smith Hall, Univ. of Washington, Seattle 5, Wash.

***May 11-13—Tucson, Ariz.**

LEAGUE OF ARIZONA CITIES AND TOWNS. Annual Conference (Pioneer Hotel). Exec. Dir., John J. DeBolske, 2727 North Central Ave., Phoenix, Ariz.

***May 14-18—New York, N. Y.**

AMERICAN ASSOC. OF AIRPORT EXECUTIVES. Annual Convention and Business Meeting (Waldorf-Astoria Hotel). Exec. Sec., F. R. Hoyt, P. O. Box 1450, El Paso, Texas.

May 15-20—Bal Harbour, Fla.

AMERICAN WATER WORKS ASSOCIATION Annual Convention (Americana Hotel) Exec. Sec., Raymond J. Faust, 2 Park Ave., New York, N. Y.

May 16-19—St. Paul, Minn.

NATIONAL INSTITUTE OF MUNICIPAL CLERKS. Annual Meeting (Lowry Hotel). Sec., Arthur J. Shinners, Town Hall, Brookline Mass.

May 16-20—Montreal, Canada

NATIONAL FIRE PROTECTION ASSOC. Annual Meeting (Queen Elizabeth Hotel). Gen. Mgr., Percy Bugbee, 60 Batterymarch St., Boston, Mass.

May 22-26—Cincinnati, Ohio

AIR POLLUTION CONTROL ASSOCIATION. Annual Meeting (Netherland-Hilton) Exec. Sec., Arnold Arch, 4400 Fifth Ave., Pittsburgh 13, Pa.

May 22-26—Bal Harbour, Fla.

AMERICAN SOCIETY OF PLANNING OFFICIALS Annual Conference (Americana Hotel) Exec. Dir., Dennis O'Harrow, 1313 E. 60th St., Chicago 37, Ill.

***May 23-25—Gatlinburg, Tenn.**

TENNESSEE MUNICIPAL LEAGUE. 21st Annual Convention (Riverside Hotel). Sec., Herbert J. Bingham, Life and Casualty Tower, Nashville 3, Tenn.

May 24-27—Washington, D. C.

NATIONAL RIVERS & HARBORS CONGRESS. 47th National Convention (Mayflower Hotel). Exec. Vice-Pres., William H. Webb, Suite 523-A, La Salle Bldg., 1028 Connecticut Ave. N.W., Washington 6, D. C.

May 28-June 3—San Juan, Puerto Rico

INTERNATIONAL FEDERATION FOR HOUSING & PLANNING and INTER-AMERICAN PLANNING SOCIETY. Joint World Congress (University of Puerto Rico). Sec.-Gen., Humberto Espinosa, P. O. Box 1729, San Juan, Puerto Rico.

(Continued on page 208)

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RUGGED — DEPENDABLE
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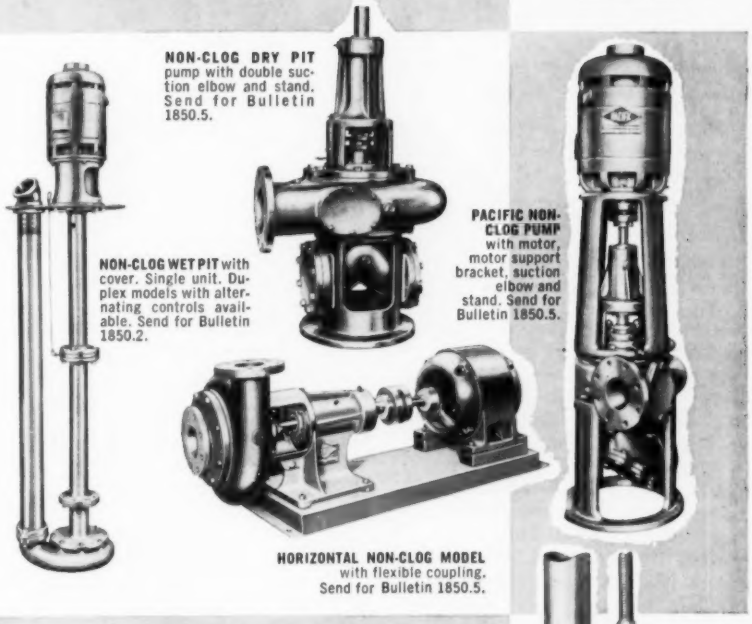

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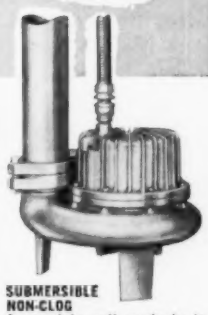

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(Continued from page 207)

***June 2-4—Ocean City, N. J.**
EASTERN ASSOC. OF FIRE CHIEFS. Annual Convention (Flanders Hotel). Sec., Edwin J. Clark, Box 328, Wayne, Pa.

June 5-9—New York, N. Y.
MUNICIPAL FINANCE OFFICERS ASSOC. OF THE U. S. AND CANADA. Annual Meeting (Statler Hilton Hotel). Exec. Dir., Joseph F. Clark, 1313 E. 60th St., Chcago 37, Ill.

June 5-10—Atlantic City, N. J.
NATIONAL CONFERENCE ON SOCIAL WELFARE. Annual Forum (Convention Hall, Ambassador and Ritz-Carlton). Sec., Joe R. Hoffer, 22 W. Gay St., Columbus 15, Ohio.

***June 15-17—Madison, Wis.**
CENTRAL STATES SEWAGE AND INDUSTRIAL WASTES ASSOC. Annual Meeting (Hotel Lorraine). Sec.-Treas., Scott E. Linsley, 2400 Childs Road, St. Paul 6, Minn.

June 26-July 1—Atlantic City, N. J.
AMERICAN SOCIETY FOR TESTING MATERIALS. Annual Meeting (Chalfonte-Haddon Hall). Sec., R. J. Painter, 1916 Race St., Philadelphia 3, Pa.

***June 27-29—New York, N. Y.**
AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS. 61st Annual Meeting (Waldorf-Astoria Hotel). Chairman, Wolcott E. Andrews, 238 East 68th St., New York 21, N. Y.

July 18-22—San Francisco, Calif.
NATIONAL ASSOCIATION OF SANITARIANS. Annual Meeting (Jack Tar Hotel). Sec., Nicholas Pohlit, c/o Univ. of Denver, Denver 10, Colo.

Aug. 14-17—New York, N. Y.
AMERICAN PUBLIC WORKS ASSOC. Annual Convention (Manhattan Hotel and New York Coliseum). Exec. Dir., Robert D. Bugher, 1313 E. 60 St., Chicago 37, Ill.

Aug. 14-17—Miami Beach, Fla.
NATIONAL ASSOCIATION OF COUNTY OFFICIALS. Annual Meeting (Hotel Fontainebleau). Exec. Dir., Bernard F. Hillenbrand, 1001 Connecticut Ave. N.W., Washington 6, D. C.

***Aug. 14-19—Boston, Mass.**
NATIONAL SHADE TREE CONFERENCE. Annual Meeting (Statler-Hilton Hotel). Sec., L. C. Chadwick, Dept. of Horticulture, Ohio State Univ., Columbus 10, Ohio.

***Sept. 11-15—Long Beach, Calif.**
AMERICAN INSTITUTE OF PARK EXECUTIVES. Annual Convention (Lafayette Hotel). Exec. Sec., Alfred B. LaGasse, Oglebay Park, Wheeling, W. Va.

***Sept. 11-16—Pittsburgh, Pa.**
ILLUMINATING ENGINEERING SOCIETY. National Technical Conference (Penn-Sheraton Hotel). Managing Dir., A. D. Hinckley, 1860 Broadway, New York 23, N. Y.

***Sept. 12-16—Chicago, Ill.**
INSTITUTE OF TRAFFIC ENGINEERS. Annual Meeting (Edgewater Beach Hotel). Exec. Sec., David M. Baldwin, 2029 K St. N.W., Washington 6, D. C.

***Sept. 19-22—New York, N. Y.**
INTERNATIONAL MUNICIPAL SIGNAL ASSOC. Annual Conference (Hotel Astor). Sec., Irvin Shulsinger, 130 West 42nd St., New York 36, N. Y.

***Oct. 2-6—Philadelphia, Pa.**
WATER POLLUTION CONTROL FEDERATION, formerly the Federation of Sewage and Industrial Wastes Associations. Annual Meeting (The Trade & Convention Center). Exec. Sec., Ralph E. Fuhrman, 4435 Wisconsin Ave. N.W., Washington 16, D. C.

MUNICIPAL AND CIVIC PUBLICATIONS

Publications on these pages are available from the addresses indicated and are usually free unless a price is given.

Pavement Design Studies

FLEXIBLE PAVEMENT DESIGN RESEARCH: 1959—*Highway Research Board of The National Academy of Sciences, National Research Council,* 2101 *Constitution Ave., Washington, D. C. Bulletin No.* 233. 1959. 56 *pp.* $1.

This bulletin contains three papers presented at the 38th Annual Meeting of The Highway Research Board, entitled "Development and Performance of Flexible Pavement on the New Jersey Turnpike;" "Dynamic Forces Exerted by Moving Vehicles on a Road Surface;" and "Re-Evaluation of Kentucky Flexible Pavement Design Criterion." The first paper describes original construction and attendant problems and evaluates the present condition of the turnpike pavement, describing measures being taken to correct pavement deficiencies. The second paper describes an apparatus for measuring forces exerted at a point on a road surface by the wheels of moving vehicles and test results showing the influence of these forces. The last paper presents a statistical comparison of actual pavement performance with the designed life as predicted by the design curves currently in use with suggested revisions to adjust to conditions as found.

New Water Meter Manual

WATER METERS, SELECTION, INSTALLATION, TESTING AND MAINTENANCE—*AWWA M6 Meter Manual, American Water Works Association,* 2 *Park Ave., New York* 16, *N. Y.* 1959. 84 *pp.* $1.25.

This manual covers the essentials of cold water meter selection, installation, testing and maintenance. Photographs, drawings and tabular data help present the material in a clear and concise form. The booklet also includes a brief chapter highlighting the history of meter development.

The San Francisco Region

THE SAN FRANCISCO BAY AREA, A METROPOLIS IN PERSPECTIVE—*By Mel Scott. University of California Press, University of California, Berkeley* 4, *Calif.* 1959. 333 *pp.* $12.50.

Primarily, this will be of interest to the people of San Francisco and Oakland. Planners and other students of urban government will have some interest in it, however, because of the many aspects of city planning that crop up in the text. San Francisco is one of the few cities in the nation that has rebuilt, following a widespread, disastrous fire. And although intentions were good, results often fell short of the planning. The author describes in active, readable prose, the story of rivalries and heart-aches that have created stumbling blocks to the orderly growth of the area. But he holds that the area can move and is moving to form a truly cohesive community, reaching toward a high level of commercial, industrial and residential development.

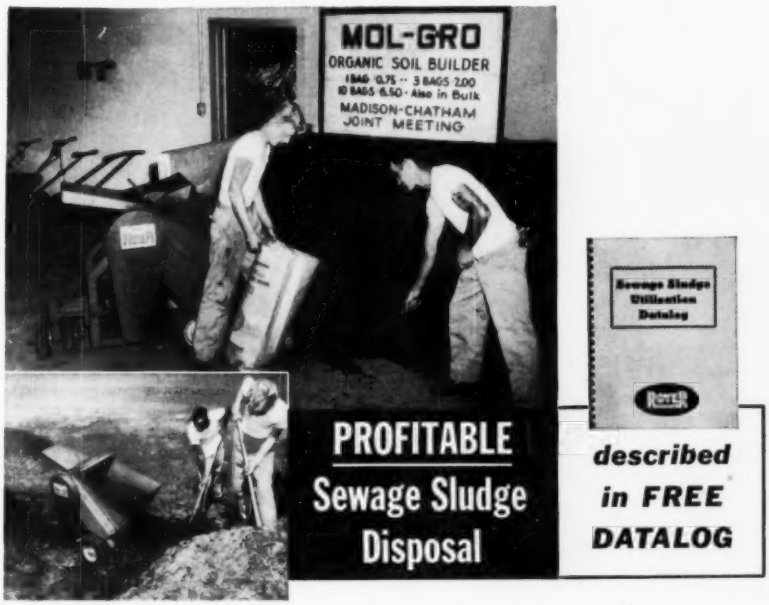
The text lists the city's first "plan," prepared in 1835 and followed carefully. The projection of this plan, disregarding street gradients, has produced the fantastic street grades typical of the city today. The plan of Oakland, prepared in 1853, shows at least six blocks extending into the bay.

Restricted Covenants

CAUCASIANS ONLY—*By Clement E. Vose. University of California Press, University of California, Berkeley* 4, *Calif.* 1959. 296 *pp.* $6.

A record of the persistent, skillful legal battle by NAACP to overturn restrictive covenants in real estate titles and conveyances. The book quotes thought-provoking and dryly amusing testimony showing the difficulty one has scientifically identifying one man as a Negro and proving another to be white, even in cases that appear obvious. It also uncovers in as objective a way as it can the deep, emotional conflicts entwined in all the legal decisions that have tried to resolve questions arising from cases challenging the legality of these covenants. It gives the reasoning of Negro lawyers when they supported "block-busting" real estate operators interested primarily in high profits. It indicates why one of the nation's finest educational institutions in Constitutional law and civil rights is the Howard Law School. Among the illustrations is a picture of the neat but certainly unpretentious row house in Washington, D. C., that figured in one of the key Supreme Court decisions.

The text may not be a best-seller today but it will be a reference book for writers and students on this sensitive and emotionally explosive phase of our urban society for many years to come.



The Madison-Chatham (N.J.) Joint Meeting bags and sells their *Royerated sewage sludge cake.* While not big business, the operation does represent an additional source of municipal income.

The need for increasing municipal income, keeps growing in importance. The climate of today's economy warns against tax increases. Economies of operation are being searched for.

One of the most obvious economies that any organization can practice is the elimination of waste. Yet many sewage plants continue to dump or burn their sludge cake — throwing away or sending possible income up in smoke.

In April 1957, Royer published a new edition of their "Sewage Sludge Utilization Datalog," pointing the way to turning sewage from an expense into a profit. Since then, we've gone through two printings.

If your community is still destroying this source of revenue, write today—and learn how you, too, may experience *profitable sewage sludge* disposal.

Please send me a copy of your new edition of the information-packed "Sewage Sludge Utilization Datalog."

Name_____ Title_____

Plant_____

City_____ Zone____ State____

☐ I am interested in a demonstration of the Royer Shredder at work.

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BECAUSE DANLINE:

Outwears fibre 15 to 1.

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Because — only a brush manufacturer with Newark's 66 years experience has the ability and facilities to develop a wire brush with the superior sweeping qualities of Danline. The success of Danline lies in the new and unique locked-in-place construction which permits a uniform fill of special round, crimped steel wire of unusual toughness. This construction means Danline gives you far cleaner, easier sweeping. In addition, Danline saves you money because of longer wear and quick assembly. Find out now about these and other benefits. Write for illustrated brochure.

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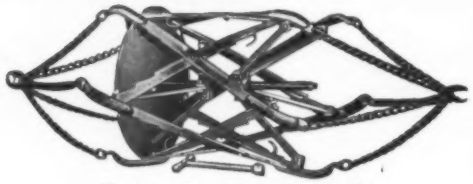

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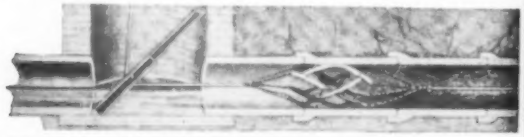
Adjusted in 30 seconds to fit sewer from 8 to 30 inches.

Will clean the entire sewer wall, top, and sides as well as the bottom, cutting and removing the roots and caked sediment, putting the sewer system in almost 100% clean condition.



Open and in action removing roots and cake sediment like this.

Write for our new catalog on complete sewer cleaning equipment.

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Milwaukee, Wis., 2014 Sunset Court
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City-County Consolidation

CONSOLIDATION? WEST COLUMBIA, CAYCE, S. C.—*Frederick H. Blair, Jr., et al, P. O. Box 818, Aurburndale, Fla.* 1959. 139 *pp.* $3.

The touchy, emotion-ridden problem of a major change in local government becomes a subject of prime interest to the people of West Columbia and Cayce County, S. C. Their findings will interest other cities facing similar problems.

Shopping Areas

THE SELECTION OF RETAIL LOCATIONS—*By Richard L. Nelson. F. W. Dodge Corporation, 119 West 40th St., New York 18, N. Y.* 1958. 422 *pp.* $9.

While this text was not aimed basically at the municipal official, it nevertheless has lots of good material for the administrator and city planner. Obviously there is no use talking about a healthy business district unless one knows what conditions are necessary to make it prosper. The author discusses such essentials as location, estimating business volume, shopping centers, and economic trends. It includes a section devoted to city planning and retail location.

Urban Freeways

STUDIES OF THE CENTRAL BUSINESS DISTRICT AND URBAN FREEWAY DEVELOPMENT—*By Edgar M. Harwood and Ronald R. Boyce. Prepared in cooperation with the Bureau of Public Roads of the Department of Commerce and the Washington State Highway Commission. University of Washington Press, Seattle, Wash.* 1959. 184 *pp.* $5.

A growing volume of working material is being developed and a great deal of it is compiled in this book. There are four sections divided into a total of nine chapters, dealing with central business district analysis, sales trends, decentralization, and the impact of freeways on the city center.

The research is organized so that each chapter or section can be read independently. Each chapter closes with a "Summary and Conclusion."

APWA Yearbook

AMERICAN PUBLIC WORKS ASSOCIATION YEARBOOK 1959—*American Public Works Association, 1313 East 60th Street, Chicago 37, Ill.* 1959. 434 *pp.* $5.

The APWA yearbook includes a Directory of Association Officials, constitution and chapter regulations, a directory of members, and the proceedings of the 1959 Public Works Congress. The papers covered a wide range of subjects, including municipal-contractor-engineer relationships; a workshop of administrative problems; and forums on solid wastes, streets and highways, water and sewage, and buildings and equipment.

ADMINISTRATION & GOVERNMENT

ANCHORAGE, ALAS.—City of Anchorage, Alaska. Municipal Charter. Office of the City Manager, City Hall, Anchorage, Alas. 1959. 36pp.

CLEVELAND, OHIO—Prologue to Progress. Cleveland Metropolitan Services Commission, 608 The Arcade, Cleveland 14, Ohio. 1959. 77 pp. $2.

IOWA—New Iowa Laws Affecting Local Government 1959. Institute of Public Affairs, State University of Iowa, Iowa City, Iowa. 1959. 41 pp. $1.

ANNUAL REPORTS WORTH READING

FREDERICKSBURG, VA.—Annual Report of Fredericksburg, Virginia 1958-1959. Office of the City Manager, City Hall, Fredericksburg, Va. 1959. 75 pp.

RICHMOND, VA.—Richmond Reports for 1958-1959. Office of the City Manager, City Hall, Richmond, Va. 1959. 16 pp.

ST. LOUIS, MO.—1st Annual Report, Downtown in St. Louis, Inc., 1958-59, Downtown in St. Louis, Inc., 407 North Eighth St., St. Louis 1, Mo. 1959. 20 pp.

FINANCE & TAXATION

COLUMBIA, MO.—Annual Budget for the Fiscal Year. Office of the City Manager, City Hall, Columbia, Mo. 1959. 104 pp.

CONNECTICUT — Assessment Administration in Connecticut Towns and Cities. By Patricia Stuart. Institute of Public Service, The University of Connecticut, Storrs, Conn. 1959. 29 pp. 50 cents.

DAVIDSON COUNTY, TENNESSEE—Capital Improvements Budget and Program Davidson County Planning Commission, Executive Office, 303 City Office Building, 2nd Ave. S. and Lindsley Avenue. 1959. 47 pp.

Now you can select new trees that fit your landscape plans exactly

The spectacular two-color SUNBURST* at right is one of a whole new family of trees developed by Cole. These new varieties have all the best qualities of the Honeylocust, yet each has distinctly different characteristics of form, color and growth.

Easy on your budget, too

All of the new Cole trees transplant easily, need no staking, are exceptionally strong, hardy and trouble-free. Adaptable to almost any soil or climate, they readily withstand ice and storm damage, drought and poor drainage. Ideal for lawns, they cause no ground-litter or fall clean-up expense.

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Distinctive, stately variety with strong trunk and shapely crown. *Needs no staking.* Dark green foliage has heavy, leathery texture.

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THE COLE NURSERY CO.
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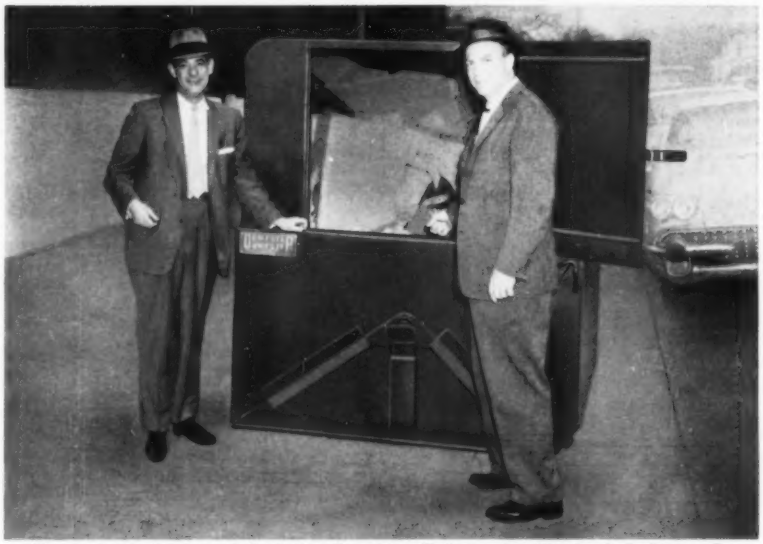
Covington, Ga. Containerizes Refuse; Cleans Up Downtown Business District

New System Reduces Costs; Draws "Rave Notices" From Users

Covington, Ga.: This progressive city of 8,000, some 30 miles southeast of Atlanta, has installed one of the most complete containerization systems in the country.

Widely known as the "City of Beautiful Homes," Covington had been plagued for some time with inadequate refuse storage facilities. Boxes, bins and knocked-over cans were permitting refuse to scatter and blow over the streets. In some areas, serious fire hazards existed; in others, unsanitary open storage, that attracted rats and flies, constituted a health hazard.



Mayor Nat S. Turner and Sanitation Committee Chairman Don Wood, of Covington, Ga., inspect one of the new refuse containers installed by the City. Forty of these containers, ranging from six to twelve cubic yards, were recently put in service.

Survey Needed

Mayor Nat S. Turner, Sanitation Committee Chairman Don Wood, Finance Committee Chairman Buck Calloway and Sanitation Superintendent O. N. Parnell met and decided to have a fact-finding survey made of the city's refuse disposal system.

Scott Holman, a sanitation engineer with Atlantic Engineering Co. of Atlanta, was chosen to make the survey. He visited every point of refuse accumulation in the commercial district to gather facts and figures. Afterwards, he computed the cubic yardage generated daily at each point, the truck and manpower costs required to move the refuse to the disposal area, and the other cost factors. Holman presented his findings to the Covington City Council, which unanimously approved his recommendation for installation of the DEMPSTER-DUMPSTER System. His survey revealed that all commercial, industrial, public building and school refuse could be handled by a one-man DEMPSTER-DUMPSTER and 40 containers, at an annual savings of over $5,500.

The System was installed in July and was enthusiastically received by all users. Many of the containers were spotted at the curb on Covington's wide sidewalks; others were placed in alleys and behind super markets.

After six months of operation, the initial enthusiasm of the downtown merchants and other users is still undimmed. Due to the many nice comments received, Mayor Turner feels that "the installation of the new system is one of the most important steps forward in the history of Covington."

Survey Offered

Cities interested in receiving a scientific survey of their refuse collection costs are invited to write the manufacturer. There is no cost or obligation for this service. A free brochure describing the DEMPSTER - DUMPSTER System is also available.

DEMPSTER DUMPSTER® SYSTEMS

DEMPSTER BROTHERS Inc.

Knoxville 17, Tenn. Dept. AC3

Dempster-Dumpster driver attaches lifting chains to loaded container which serves four business houses.

Returning to the cab, the driver hoists container into carrying position for the trip to the disposal area.

Without leaving cab, driver automatically empties a twelve cubic yard container.

MICHIGAN—Proceedings of the Thirteenth Annual Short Course for Assessing Officers. Institute of Public Administration, The University of Michigan, Ann Arbor, Mich. 1959. 97 pp.

PHILADELPHIA, PA.—Mayor Richardson Dilworth's Budget Message for 1960. Office of the Mayor, City Hall, Philadelphia, Pa. 1959. 46 pp.

PHOENIX, ARIZ.—Pay Plan. Phoenix Personnel Department, City Hall, Phoenix, Ariz. 1959. 25 pp.

SAN ANTONIO, TEX.—Annual Financial Report, City of San Antonio, 1958-1959. Bennett R. Bolen, Director of Finance, City of San Antonio, San Antonio, Tex. 1959. 183 pp.

WISCONSIN—Proceedings, Institute for Municipal Assessors. League of Wisconsin Municipalities, 30 East Johnson St., Madison 3, Wis. 1959. 49 pp. $2.

HIGHWAYS

NEW YORK, N. Y.—Arterial Progress. Office of the City Construction Co-Ordinator, 30 Center St., New York, N. Y. 1959. 32 pp.

LEGAL

PHILADELPHIA, PA.—And Justice for All. By David Berger. Office of the City Solicitor, City Hall, Philadelphia, Pa. 1959. 25 pp.

PARKS & PLAYGROUNDS

CHICAGO, ILL.—Suggested Goals in Park and Recreation Planning. Chicago Park District, Administrative Building, 425 E. 14th Blvd., Chicago 5, Ill., 1959. 46 pp.

PLANNING, ZONING & HOUSING

BERKELEY, CALIF.—Berkeley Master Plan. Berkeley Planning Commission, City Hall, Berkeley, Calif. 1959. 113 pp. $1.04.

HEALDTON, OKLA.—A General Plan Study. The Institute of Community Development, The University of Oklahoma, Norman, Okla. 1959. 53 pp.

ITHACA, N. Y.—Ithaca Urban Area; A General Plan. Community Planning Associates, 1241 Parkway Ave., West Trenton, N. J. 1959. 80 pp. $5.00.

LOS ANGELES, CALIF.—Zoning for Parking. University of Southern California Bookstore, University of Southern California, Los Angeles 7, Calif. 1959. 59 pp. $2.

MADISON, WIS.—Triangle Redevelopment and You. Redevelopment Authority of the City of Madison, City-County Bldg., 210 Monona Ave., Madison 9, Wis. 1959. 23 pp.

MEMPHIS, TENN.—Memphis Civic Center. League of Memphis Architects, Inc., 264 North Lauderdale St., Memphis 5, Tenn. 1959. 20 pp.

MONTANA—Montana Local Planning Legislation. Montana State Planning Board, Sam W. Mitchell Bldg., Helena, Mont. 1959. 28 pp.

ROME, N. Y.—Central Business District Plan. City Planning Board, City Hall, Rome, N. Y. 1959. 52 pp. $5.

SCOTCH PLAINS, N. J.—Master Plan Studies. Community Planning Associates, 1241 Parkway Ave., West Trenton, N. J. 1959. 50 pp. $3.00.

TRACY, CALIF.—Tracy General Plan. Office of the Director of Planning, City Hall, Tracy, Calif. 1959. 20 pp. $1.50.

URBAN RENEWAL

CHICAGO, ILL.—The Impact of the Hyde Park-Kenwood Urban Renewal Plan on Municipal Finances in Chicago. By Frederick T. Aschman, Community Conservation Board of Chicago, 320 North Clark St., Chicago 10, Ill. 1958. 20 pp.

WATER

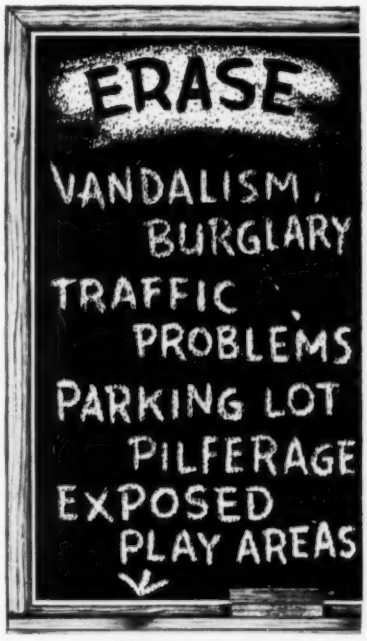
PORTSMOUTH, VA.—Annual Report 1958-59. Portsmouth Water Department, City Hall, Portsmouth, Va. 1959. 28 pp.

REPRESENTATIVE MUNICIPAL BOND ISSUES

From January 5th to February 4th, 1960

Date of Issue	*Locality*	*Amount in $1000*	*Purpose*	*Term Yrs. to Maturity*	*Rate of Int.*	*Yield %*
1/ 5/60	Montreal, Que.	13,478	Public Improvement	15	6.00	7.58
1/ 5/60	Nashville, Tenn.	4,000	Electric Power Revenue	16⅔	4.00	3.79
1/ 6/60	Athens, Ala.	530	Water and Sewer Revenue	17½	4.67	4.59
1/ 7/60	Schenectady, N. Y.	857	Urb. Redevel. & Renewal	15	3.60	3.59
1/12/60	Los Angeles, Calif.	6,700	Mun. Airport Gen. Obl.	17½	4.00	3.93
1/12/60	Monroe, La.	5,500	Water and Electric Rev.	19	4.25	4.34
1/12/60	St. Paul, Minn.	500	Detention and Workhouse Fac.	19¼	3.80	3.75
1/13/60	Washington Par., La.	600	Public Improvement	8½	4.02	4.01
1/14/60	Bridgeport Twp., Mich.	659	Sewerage Disp. System	24½	4.20	4.57
1/14/60	So. Tahoe Pub. Util. Dist. Calif.	1,250	Sewer	17½	4.93	4.90
1/18/60	Sheboygan, Wis.	4,000	Corporate Purpose	10½	3.60	3.51
1/19/60	Fullerton, Calif.	1,000	Waterworks	10	4.00	3.85
1/19/60	St. Martin Par., La.	570	Public Improvement	10½	4.20	4.22
1/19/60	Winnetka, Ill.	1,000	Electric Revenue	10½	3.60	3.53
1/21/60	Meriden, Conn.	1,000	Tax Anticipation	⅓	2.62	2.62
1/26/60	Pensacola, Fla.	1,500	Sewerage Imp. Rev.	13	4.35	4.13
1/27/60	Zanesville, O.	1,250	Sewer	14	4.25	4.08
2/ 4/60	Jefferson Par., La., 4th Drainage Dist.	2,000	Drainage Improvement	16½	4.54	4.50
2/ 4/60	New York, N. Y.	5,000	Street Repaving	3	3.40	3.35
2/ 4/60	Port Angeles, Wash.	1,700	Water Revenue	14½	4.29	4.43

***Compiled from* THE BOND BUYER**



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World's lightest motor drill!

Here's a drill you use to fill in on those jobs where cost, terrain, or time prohibits sending out a compressor crew. Weighs just 53 pounds; easily carried by one man. Completely self-contained with gasoline engine that drills 50-60 feet of hole on a tankload (2 qts.) of fuel. Drills in any position up to 45°. Perfect for light drilling anywhere. Write for complete literature. Address: Dept. AC-7

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- Multi-use flexibility!
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The above Incinerator was installed in New York City's Gansevoort Refuse Disposal Plant.

Why has our Design proven Best by Test?:

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- Front take-up is easily accessible to operator.
- Patented cast steel links, over-lapping to prevent fouling.
- Continuous discharge of refuse from grate surface.
- Applicable to largest incinerators up to 24-feet wide.
- Minimum labor and maintenance required for operation.
- No heavy stoking or cleaning of fires . . . ease of operation.

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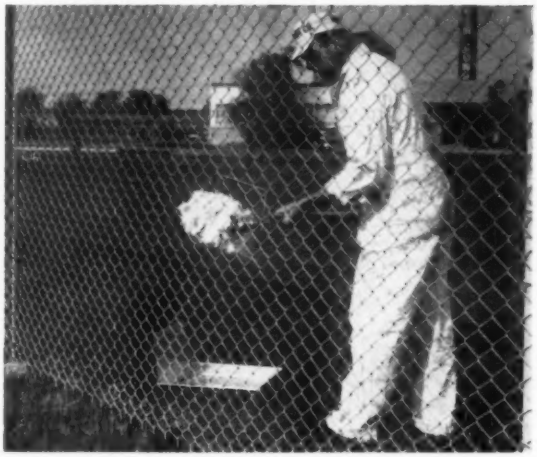

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First in an all-new line of rubber-tired wheel loaders

. . . is the Cat. No. 944 Traxcavator, with lift arms and hydraulic cylinders located *ahead* of the operator's compartment, and with a power source (either gasoline or diesel engine) rated at 105 *net* horsepower. Maximum rating of the D330 diesel engine used in the No. 944 is 135 gross horsepower.

A dumping reach of 31.75 inches at maximum dumping height of 9 feet, 1.87 inches permits precise and fast load-spotting when dumping into trucks or other vehicles.

Power train of the loader includes a two-speed forward, two-speed reverse planetary transmission, consisting of four-in-line gear trains, each with special clutch. Two of the planetary trains provide direction control; two, gear-speed selection. A manually shifted range selector transmission provides a 4-wheel drive work range, or 2-wheel drive travel range. The transmission is geared to provide 25% faster travel speed in reverse—a factor in reducing cycle times.

The No. 944 is fitted with a 2-cubic-yard capacity bucket as standard equipment. It has a tip-back angle of 41° at ground level and 50° at maximum lift. For more information, write CATERPILLAR TRACTOR CO., PEORIA, ILL., or use the Post Card on Page 56. Circle No. 887.

Ottawa takes wraps off new prime mover

At an equipment presentation just preceding the recent AED convention in Chicago, Ill., Ottawa Steel Division of Young Spring & Wire Corp. unveiled a startling new prime mover—the Commando—and complete line of contracting and materials handling equipment.

From a mechanical and operational standpoint, the Commando combines the speed and utility of a truck with the high torque, low speed of a tractor. It weighs in at 9,200 pounds, has a husky power plant, massive power train and heavy-duty set of axles. Its shuttle transmission is a split torque drive arrangement that permits full power hydraulic creep, solid direct-drive or torque converter drive.

The new prime mover turns in a 24-foot circle and is available in 2 or 4 wheel steer, 2 or 4 wheel drive. Speeds range from a controlled creep at full throttle at 0 mph to 35 mph.

There are, at present, ten hydraulically - powered Uni - Tools designed for the Commando. They can be used singly or in combination, and when mounted each tool becomes completely self-contained.

There's the Hydra - Hammer, a

NCG® wherever emergency strikes...

Handy* Resuscitators automatically breathe when the breath of life is gone.

The Handy Resuscitator does *three* important things:

1. It automatically inhales and exhales, adjusting automatically the depth of respiration to the patient's lung capacity, for an adult, child or even *infant*.
2. It can be quickly switched to "Inhalation" to supply oxygen to be absorbed by the spontaneous respiration of the patient.
3. It provides sufficient suction as an Aspirator to remove obstructing material from the throat, such as water, mucus, etc.

"BE PREPARED" for drownings, carbon monoxide poisonings, heart attacks, electric shock, strangulation, asthma, asphyxia of the new-born.

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Purchasing News

The Commando Hydra-Hammer breaks concrete, cuts asphalt, tamps fill.

powerful, fast, breaker-tamper-pile driver, that handles concrete breaking, cuts asphalt, tamps fill. It works the full machine width without tilting the tower and can tamp a swath 10 feet wide. It has creep speeds from 0 to 100 fmp.

The Commando backhoe digs 12½ feet deep in any position of a 190° swing. You can put 7,000 pounds of digging power at the point of bite. It has "One-Trols," which combine all lift, dump, dig, lower, crowd and swing operations into two levers.

A power crane, available in capacities up to 7,000 pounds and with remote control, handles pipe, building material, steel forms, etc. It rotates a full 360°. Other Uni-Tools include a fork lift, the Strato-Tower for overhead maintenance and servicing operations, a sweeper to make short work of clean-up jobs, a snow plow and dozer blade.

To facilitate field maintenance and repair, the body sections of the Commando elevate hydraulically to provide access. Thus every major machanical component can be removed and replaced from the top quickly and without major disassembly operations. Dealers in key cities provide up-to-date service shop and parts facilities and, where necessary, a unique "Air-Lift Parts-Service Plan" sends factory-trained "flying servicemen" to the job.

As an aid to the operator, Ottawa has color coded the cab controls to match working attachments. It is expected that this will also increase efficiency and safety.

Detailed literature and specifications on the Commando and its matched attachments are available. To obtain them, write OTTAWA STEEL DIVISION OF OTTAWA SPRING & WIRE CORP., OTTAWA, KAN., or use the Post Card on Page 56. Circle No. 888.

Body sections of the Commando elevate hydraulically to provide easy access to major mechanical components —power train, engine, drive axles.

Universal Indicating Transmitter

Model 45 Series is the designation for a new line of pneumatic indicating transmitters designed for in-plant and remote telemetering of pressure, temperature, liquid level, differential pressure in water works.

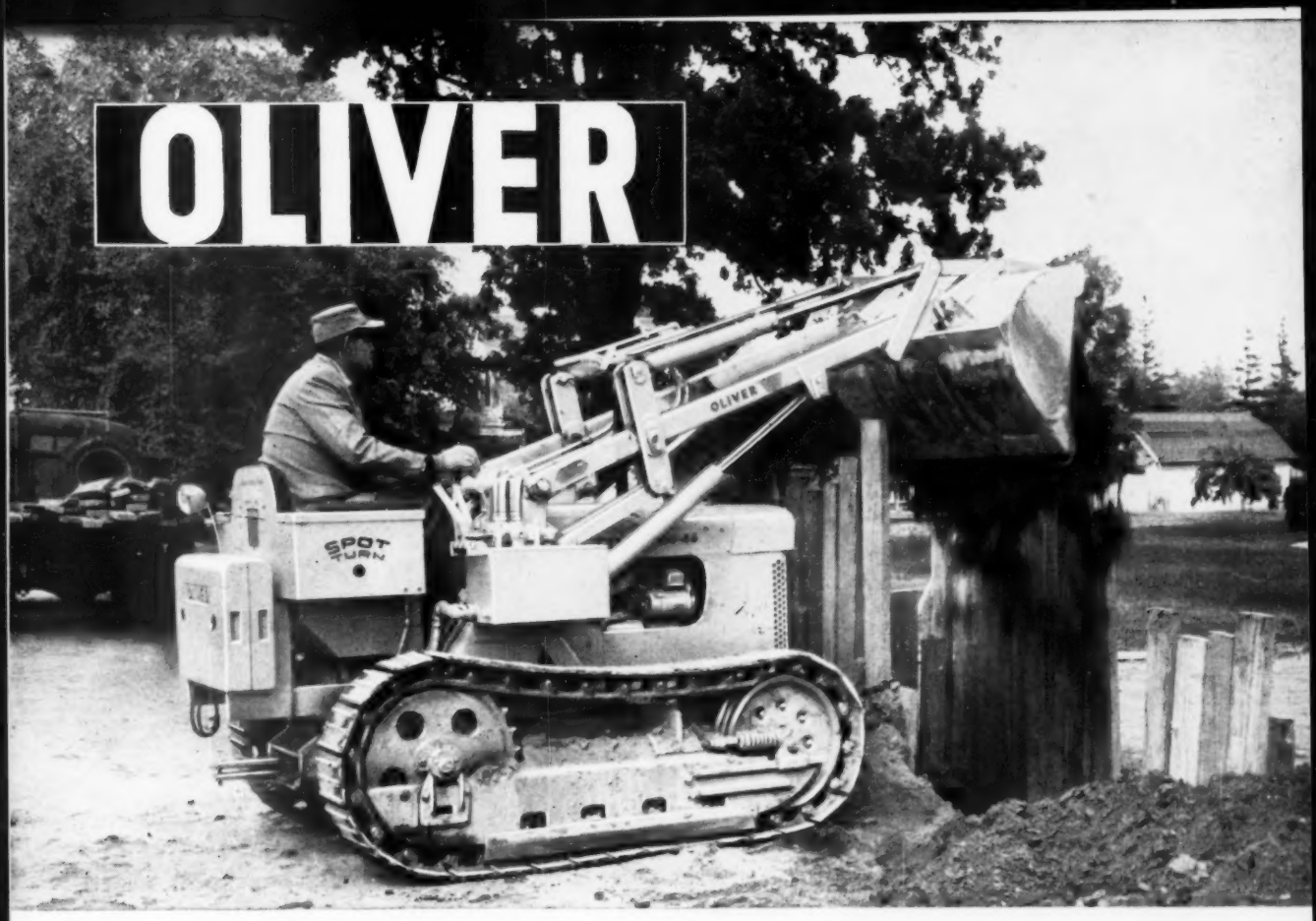
Measuring elements are specifically designed for each major process variable. The transmitter is available with measuring elements in the following ranges:

Pressure: 0-10 inches water to 0-80,000 psi;
Temperature: −450°F to +1,000°F (−270°C to +500°C);
Flow: (differential pressure): 0-1 to 0-400 inches water;
Liquid Level: open vessels 0-10 inches water minimum; closed vessels 0-20 inches water minimum.

Output signal is reported to be 3-15 psi (with 3-27 psi optional).

(Continued on page 219)

OLIVER



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Have a look at this new tractor catalog on the OC-4 "Spot-Turn." It's filled with application pictures and data...shows many different work-speeding equipment changes! It's important reading for tractor users. Mail the handy coupon today!

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spreads Sand, Gravel, Slag and Salt

Spreads aggregate from powder fine to 3" depths.

Automatic Transmission operates forward or reverse without shifting gears.

The Good Roads "Handy" Aggregate Spreader is designed for smooth and accurate spreading of sand, slag, stone, gravel, calcium-chloride, etc., up to 1" in diameter—from powder fine to 3-inch depths.

Ideal for parking lot, street, road, highway construction and maintenance, it is available in 6 models for spread widths of 8, 9, 10, 11, 12, and 13 feet. Narrower widths can be accomplished by use of block-off plates.

For complete details see your local distributor, or write to:

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FILTER SAND AND GRAVEL

Produced from an inland pit hence free from river contamination and foreign matter.

Shipment in bulk or bagged.

Many of the larger filter plants throughout the United States are equipped with our products.

PROMPT SHIPMENT

Inquiries and orders solicited

NORTHERN GRAVEL COMPANY
Muscatine, Iowa
P.O. Box 307 Amherst 3-2711

(Continued from page 216)

The transmitter operates on a 20 psi air supply.

Model 45 is said to have a high ambient temperature stability, with less than ½% error for ambient temperature changes as great as 50°F, regardless of the variable measured. Overall calibrated accuracy of the transmitter, including measurement and output signal, is guaranteed to be within ± ½%.

Link and lever calibration and a minimum of moving parts make the Model 45 easy to adjust and maintain. For more complete information, write THE FOXBORO CO., FOXBORO, MASS., or use the Post Card on Page 56. Circle No. 891.

Handles Volume Accumulations of Trash and Refuse

For municipalities faced with the problem of long hauls to refuse disposal areas, relief is offered in the form of a new, completely hydraulic compaction trailer, introduced by Dempster Brothers.

Model DB-42 packs in approximately 16 cubic yards of loose refuse. It is 34'7" in length and 10⅔' high. Model DB-53 holds approximately 210 cubic yards of loose refuse. It is 12½' high and the same length as Model DB-42.

According to the manufacturer, cities already owning their own detachable container system of refuse storage may use these containers in conjunction with the new trailer by employing ramps or extended-mast, truck-mounted GRD's. The huge trailers also act as portable dumps or transfer storage stations where small Dempster-Dumpster containers can be emptied, as well as conventional trucks and packers. The large hopper can hold the contents of a 16-cubic-yard packer truck.

This huge hydraulic packer, compacts refuse and trash to a fraction of its former volume.

The packing mechanism is controlled by one double-acting lever. An 18-gallon pump at the front of the trailer gathers liquids when wet refuse is compacted. For additional information, write DEPT. CT-84, DEMPSTER BROS., KNOXVILLE, TENN., of use the Post Card on Page 56. Circle No. 859.

Truck Body Houses Chipper; Tilts for Dumping Chips

This tilt action truck body with built-in brush chipper unit is a new offering from Asplundh Chipper Co. The 12-inch brush chipper is mounted on any 2-ton chassis with 102-inch cab axle; the truck body has approximately 285 feet of load space. There is plenty of room for wood

For your town . . .

A MODERN Standard Steel

FLOATING BOAT MARINA

At Hannibal, Mo. — 800-foot Floating Marina handles 112 boats, serves gas, oil, refreshments.

Help boost your community to Leadership in today's BOATING BOOM!

Check STANDARD STEEL *Now* for the finest, safest, strongest, most modern boat marinas — at lowest cost! Pre-planned, pre-fabricated for quick installation and years of rugged service, they pay for themselves quickly out of revenue.

No obligation . . . Write or phone for consultation with our qualified marina engineer on marina planning.

SEE THESE TYPICAL INSTALLATIONS: —*
HANNIBAL, MO.
PEORIA, ILL.
LANSING, IA.
HAVANA, ILL.
LEXINGTON, KY.
MASSENA, N.Y.

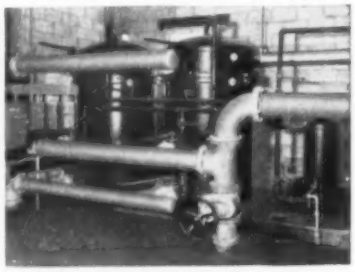
*INCLUDE:
FLOATING DOCKS, PIERS, BOAT SLIPS, SERVICE PATIOS, RAMPS, STAIRWAYS, BOAT CANOPIES, COMPLETE ACCESSORIES

Standard Steel
PRODUCTS MFG. CO.
Dept. A., 2836 S. 16th St., Milwaukee 15, Wis.
Branches: Paramus, N.J., Detroit, Mich.

LEADERS IN MODERN ALL-STEEL WATERFRONT EQUIPMENT

- BAKER PARK MUNICIPAL POOL, Frederick, Maryland, 400,000 gallons
- Filter System Design, W. R. Walter, City Engineer, Frederick, Maryland
- Filters: 2 SPF-169 R. P. Adams Company, Inc.

Shown is a typical Adams SPF Swimming Pool Filter installation. These filters are available in a wide range of sizes for pools of 50,000 to several million gallons capacity. All sizes are normally available from stock. We do not offer a filter for backyard pools.



HERE'S WHY MANY CITIES INSIST ON ADAMS Swimming Pool Filters

- **LOWER INSTALLATION COSTS** because it takes only a fraction of the floor space of sand filters . . . does not require massive concrete foundations.
- **TROUBLE-FREE OPERATION** . . . you never have to disassemble it for cleaning . . . as one city engineer said, "Yours is the only diatomite filter with backwashing that works".
- **PERMANENT PORO-STONE MEDIA** is inert to chemical corrosion and electrolytic action of chlorinated water. —All Adams SPF filters now in service are still equipped with the original tubes.
- **QUALITY IN EVERY PART** . . . stainless steel support rods and nuts for the tubes . . . galvanized forged steel closure plates and clips . . . *three* coats of vinyl plastic lining on sand blasted inner surfaces.

The R. P. Adams Company is the nation's largest manufacturer of filters exclusively for municipal, commercial and institutional pools.

For detailed information, write for our new technical Bulletin 626. It was prepared to help you with your swimming pool filter problems.

Our diatomite filters for municipal water supplies is discussed in Bulletin 651. Ask for it at the same time.

R. P. ADAMS CO., Inc. • **202 East Park Drive, Buffalo 17, N. Y.**

Controlled feeding of dry materials with SYNTRON Vibra-Flow DRY FEEDER MACHINES

—dry feeding of material enables closer control of material flow, eliminates waste, reduces labor cost.

SYNTRON Dry Feeder Machines provide an efficient, dependable, low cost method of feeding dry chemicals to water and sewage treatment systems.

SYNTRON Dry Feeder Machines feature

● rheostat control of flow rate ● wide range of capacities ● dependability ● long equipment life ● low maintenance

Reduce dry material feeding cost—eliminate waste with SYNTRON Dry Feeder Machines.

Write for complete catalog data today.

SYNTRON COMPANY
Quality Equipment Since 1922
430 Lexington Ave. Homer City, Penna.

For a Fascinating time in FLORIDA

Sea Castle APARTMENT MOTEL

10750 GULF BLVD. TREASURE ISLAND
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New, ultra modern one-bedroom apartments with kitchenette and TV in each unit. There's a beautiful beach and swimming pool, tropical patio and plenty of parking space.

★ BOATING ★ WATER SKIING
★ GOLF ★ SIGHTSEEING ★
★ DINING ★ DANCING
NIGHTLIFE ★ RACING

WRITE: For Free Brochure and Rates today

chips and adequate storage space for ladders, tools and other equipment. Personnel quarters comfortably seat six crewmen and the driver. The tilt body is designed for quick dumping in a matter of seconds. The hydraulic hoist has dash controls within the truck cab.

For more detailed information, write ASPLUNDH CHIPPER CO., 501 YORK RD., JENKINTOWN, PA., or use the Post Card on Page 56. Circle No. 871.

Asplundh's tilt-mounted truck body with built-in brush chipper.

Front-Mounted Sweeper

Little Giant's front-mounted sweeper can be mounted on any type tractor, truck, Jeep or similar prime mover. It is equipped with hydraulic ram for raising brush to adjust to ground pressure. Rotation of the brush is approximately 150 rpm and is entirely independent of prime mover. Brush angles about 30 degrees right or left. Brushes are of tough, wear resistant Palmyra

This tough "little giant" sweeps away snow at a fast clip.

Acquires Valve Operator Line

Hupp Corporation of Cleveland, Ohio has acquired for an undisclosed sum the manual valve operator business of Jones Machinery Division, Hewitt-Robins, Inc. The purchase includes tooling, inventory and engineering designs.

In making the announcement, Don H. Gearhart, Hupp president, said that "the manual valve operator is a logical companion product for the Electrodyne automatic valve operator now produced by Hupp Aviation division." He further noted that "it can be mounted directly on a valve or used in connection with the automatic operator to provide greater torque capacity." Greatest market potential for the product is expected to be in water works and sewage plants where manual valves or manual-electric valve combinations are used to operate butterfly valves.

All standard sizes of the manual valve operator are now in production at Hupp's Chicago-based Aviation division plant.

A Correction

Item #374 on page 50 of the Catalog Section of the February issue was titled "Long Pinch Pintle Chain for Sewage Treatment Plants." The word "Pinch" should have been "Pitch".

TENNANT MODEL 100 is available with cab, power steering, flashing lights, rotating beacon, etc.

Now . . . a new way to sweep up ALL the dirt

You've never seen such clean sweeping as you'll get with the TENNANT Model 100 Vacuumized Sweeper.

Powerful pickup. Cleaning a 7'4" path, this remarkable new sweeper gets virtually *all* the dirt. Particles fine as 5 microns (far smaller than human eye can see) are caught by the huge 540 sq. ft. filter.

No dust, no water. Since the Model 100's powerful brush-and-vacuum system captures the dust, there's no need for water spray . . . therefore no unsightly mud streaks, no winter freeze-up problem.

Many uses. Short (10'2") turning radius and ultra-clean sweeping makes the TENNANT 100 ideal for downtown areas, alleys, parking lots, tunnels, bridges, air terminals, better residential areas . . . wherever you want *really clean sweeping!*

WRITE TODAY *for complete specifications and performance data. G. H. Tennant Company, 751C N. Lilac Drive, Minneapolis 22, Minnesota.*

TENNANT

VACUUMIZED SWEEPERS

fibre, although steel brushes are available.

Power is supplied by either a 7.4-, 11.5-, or 15.2-hp air-cooled Wisconsin engine. Chain and sprocket drive rotates brush. If necessary, prime mover can be slowed down for heavy accumulations while brush maintains a constant speed.

The sweeper is of all-welded construction, and comes in 6-, 7- and 8-foot lengths. Height of the sweeper is 51"; diameter of the brush is 31". For more detailed information, write LITTLE GIANT PRODUCTS, INC., 1530-50 N. ADAMS ST., PEORIA, ILL., or use the Post Card on Page 56. Circle No. 880.

Tractor Shovel

The Massey-Ferguson 406 tractor shovel offers front, rear and side vision for the operator, features full-time power steering, instant reverse with torque converter, five equal forward and reverse speeds. Low pivot points of the lift arms put the push directly into the load—instead of through linkage—providing bulldozer action and 9300-pounds pry-out capacity.

Attachments include any model of

M-F backhoes, rotary broom, angle dozer, lift fork, swinging cranes, scarifier (mounted at bucket hinge), scarifier-scraper (three-point rear mounting), Ram pick-up street sweeper, Ram rotary snow blower, and Ram leaf loader. For additional information, write MASSEY-FERGUSON INDUSTRIAL DIVISION, BLOCK 1,-000 SOUTH WEST ST., WICHITA, KAN., or use the Post Card on Page 56. Circle No. 864.

Picnic Tables

These picnic tables are designed primarily for park use. They can be assembled in less than an hour and dismantled in minutes. Hence their name, "TAK-A-PART" picnic tables.

The tables may be purchased complete with factory pre-cut and drilled lumber for the top and seats, or only the metal parts purchased and the top and seats built by park maintenance staff from 2" x 8" and 2" x 10" boards.

Use of braces and frames is elimi-

TAK-A-PART picnic tables are designed for easy access.

The most serviceable galvanized waste cans have the **Lawson** label...

the guarantee of quality since 1816

EXTRA HEAVY CANS

Scientifically designed for greatest strength and durability . . . 24 gauge body, heavy steel reinforcing bands, hand-dipped galvanized . . . conform to Federal Specifications RR-C-82a.

- No. 320—26" high, 32 gal.
- No. 240—25" high, 24 gal.
- No. 16—24" high, 16 gal.
- No. 10 (with bail) 10 gal.

LAWSON UNIVERSAL DOLLY No. 444

Wheel out heavy cans—avoid lifting and possible injury! Heavy duty steel dolly handles cans of many sizes; also handles large 55-gal. drums.

ALL SERVICE CONTAINERS

For hospitals, restaurants, institutions — wherever cleanliness is a must! Heavy 18 gauge steel, drawn rounded bottom. Smooth inside and out for easy cleaning.

- No. 200–25 gal. • No. 100–12½ gal.

SEE YOUR DEALER

Warehouses in Principal Cities

THE F.H. LAWSON CO.

EST. 1816 • CINCINNATI 4, OHIO

LAWSON PRODUCTS ARE NATIONALLY ADVERTISED

nated by the "walk-in" design of the 1½" welded steel tubing used in the end frames. "Slide-easy, skid-type" feet permit the table to be moved easily when mowing and protect the turf from damage.

Two end frames support tables up to 10 feet in length. The use of a third frame in the middle permits a table of greater length. All metal parts are finished in automotive-type green baked enamel to withstand weather wear. Midwest also makes a matching "Kiddie Table" for children. For additional information, write Midwest Metal Stamping Co., Kellog, Ia., or use the Post Card on Page 56. Circle No. 847.

J-M Buys Plastic Pipe Firm

Johns-Manville has agreed to purchase for an undisclosed cash sum the principal assets of Franklin Plastics, Inc. of Franklin, Pa., manufacturers and distributors of extruded plastic pipe. "This purchase will provide Johns-Manville with a new product line of flexible extruded thermoplastic pipe," said A. R. Fisher, board chairman.

"Responsibility for producing and selling the J-M extruded plastic pipe line will be assigned to the J-M Pipe Division, which also manufactures and markets a broad line of asbestos-cement pipe products," added Mr. Fisher.

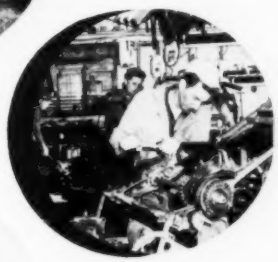
Scraper Unit for Cat Motor Graders

Martin Co. has a new 3½-yard (heaped) scraper unit that can be mounted in place of blade and circle on Caterpillar No. 112, 12 and 14 motor graders. Operated by the regular grader controls, the "GraderscrapeR" mounts on the circle lift arms and uses full power of the grader tandem drive to load without pushing. Once loaded, it can be lifted with the mechanical drive of the grader and carried at full traveling speed to the dump area. It requires a road clearance of 11 inches, fully loaded.

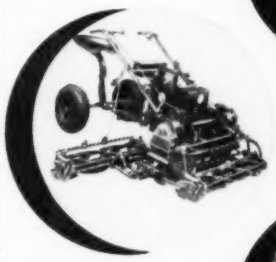
"GraderscrapeR" is the first scraper unit that can be tilted to one side, to scrape ditch sides while the grader remains level. It can be tilted to either side 17° and can be shifted to either side of the machine

GRASS IS HERE TO STAY
...is your mower?
invest in a Locke and save!
COMPARE:

● MANEUVERABILITY
A LOCKE turns at any angle. Overhangs raised borders by ⅓. Cuts trimming time in half; leaves no streaks, rolled or uncut grass. Does yours?



● SERVICE
LOCKES are sold and serviced only by specialists, averaging 23 years in business. They must meet our code of ethics. Who services yours?



● LONG TERM EQUIPMENT
A LOCKE'S life expectancy is 3000-4000 hrs. (14 to 19 yrs.) What's yours?

● DEPRECIATION
A LOCKE'S dollar depreciation averages 57% in 10-19 yrs. (Others: 69% in 10-14 yrs.) What's yours worth today...10 years hence?

SINGLES: 25" and 30"
Plain or reverse
2½, 5 h.p. 4 cycle engines
TRIPLEX: 70" and 75"
Plain or Reverse
7, 9 h.p. 4 cycle engines
Sulkies Attach.

Locke POWER LAWN MOWERS
1315 Connecticut Avenue Bridgeport 1, Conn.
A product of Locke Steel Chain Co.

Send for these New Locke data sheets

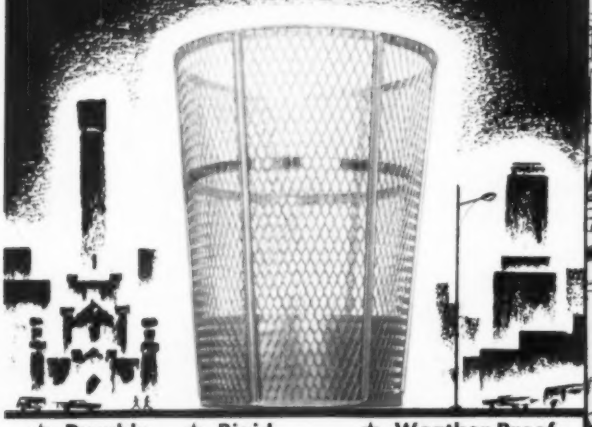
Now is the time to take your grass cutting costs seriously. ASK YOUR LOCKE Service Dealer for the facts, or write.

Locke Mower Div.
Locke Steel Chain Co.
1315 Connecticut Ave., Bridgeport 1, Conn.
Gentlemen: We are most certainly interested!
☐ Please have your dealer phone me.
☐ Send your latest literature.
NAME _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE STATE

DEMCOR E-X-P-A-N-D-E-D METAL

LITTER BASKETS

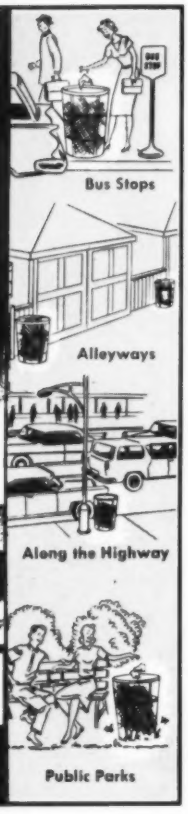
Help keep your city CLEAN



★ Durable ★ Rigid ★ Weather Proof
★ Low-cost ★ Galvanized ★ Built to last

Write for complete description and prices

DESIGNERS METAL DIVISION
North American Cement Corporation
650 Hoffman Street · Hammond, Indiana



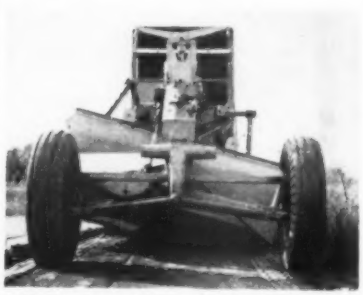
Big tool boxes hold full set of tools; fuel tank holds 8 hours' supply. Radiator shutters adjust to weather. Pneumatic tired retractable dolly is standard.

Jobs go smoother with a Jaeger Rotary

All users notice the difference. Jaeger's slower running speed (only 1700 rpm @ full load) consumes less fuel; better control holds pressure constant; air is 100° cooler than with old-type compressors; the machine is smoother, quieter, simple to operate, easy to move. Ask your Jaeger distributor to show you, or send for Catalog JCR8.

The Jaeger Machine Company • 505 Dublin Ave., Columbus 16, Ohio

Purchasing



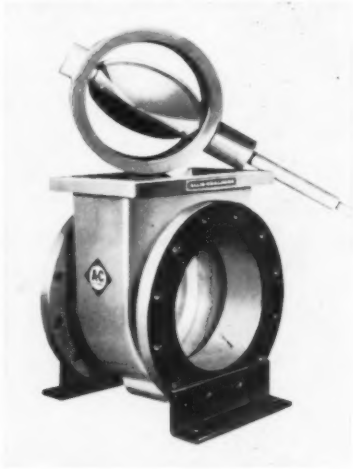
"GraderscrapeR" with 9½-foot cutting width, is well adapted to light and medium leveling work.

to cut 6 inches outside the grader wheels.

Dumping and apron opening are controlled by a hydraulic system added to the rear of the motor grader engine. It operates independently from the grader clutch supplying full power to the system at all times. Apron opening is 19½ inches.

For additional information, write MARTON CO., 620 ANDREWS AVE., KEWANEE, ILL., or use the Post Card on Page 56. Circle No. 896.

Cartridge-Type Butterfly Valve



Allis-Chalmers developed this new cartridge-type butterfly valve and designed it for quick and easy replacement. It is shown here with removable wedge-shaped insert for ease in cleaning the lines without disturbing the line flanges or piping.

The cartridge unit consists of a standard butterfly valve in a wedge-shaped body, which is inserted in the outer body and held in place with the cover. Its flow character-

issues are identical to the standard two-flange valve. The cover of the valve and the shaft extension accommodate standard manual, diaphragm, motor or cylinder operators. For additional information, write ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP, MILWAUKEE 1, WIS. or use the Post Card on Page 56. Circle No. 869.

Larger, Versatile Equipment Offsets Other Price Rises

At the recent 41st Annual Convention of Associated Equipment Dealers of America, held in Chicago, Ill., John A. Baldinger, vice president of The Yale & Towne Manufacturing Co. of Batavia, N. Y. and San Leandro, Calif., noted that the nation's contractors are offsetting rising costs of materials, land and labor by using new, boldly designed, multiple-purpose construction equipment.

"Public roads, sewage and water systems, new plants and commercial building, municipal repair and maintenance operations and public utilities construction are just some of the major areas that the construction equipment industry will be called upon to serve in greater volume than perhaps in any year since 1956," Mr. Baldinger said.

Citing the experience of his own company, he added that "Yale & Towne's Trojan tractor shovels are designed, engineered and produced to do many more jobs than machines of this kind were originally intended."

Water and Gas Meter Sales

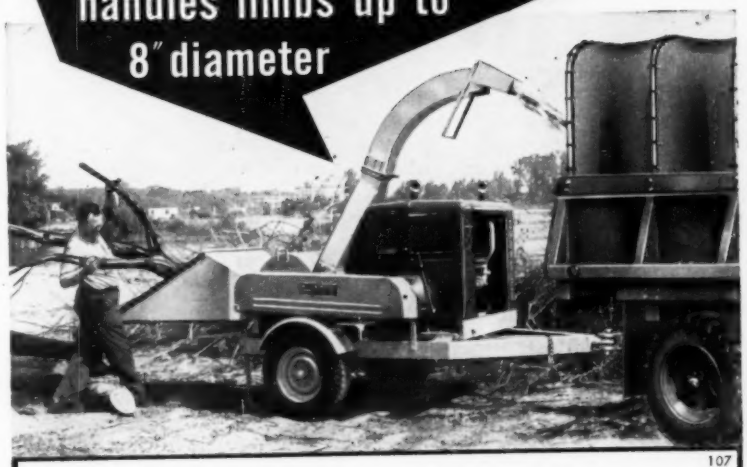
Demand for water and gas meters is expected to slacken somewhat in 1960 because of fewer housing starts predicted for the year, according to Lloyd A. Dixon, Jr., vice president in charge of Rockwell Manufacturing Company's Meter and Valve Division. He does, however, expect "a decade of steady growth in the business of selling gas and water meters—perhaps with a few really 'excellent' years. The increased business will be the result of: (1) the population growth—another 50 million people by 1980; (2) the continuing growth of the natural gas industry—one of the fastest growing industries in the country, and (3) the ever-present problem of providing enough water for growing—industrial and home use in the face of a rapidly decreasing supply."

Renames Division

Food Machinery and Chemical Corp. of San Jose 6, Calif., has announced that its Peerless Pump Division, with headquarters in Los Angeles, and seven associated operations in pump manufacturing and allied fields is now operating under a new organizational name: Hydrodynamics Division.

Under the new divisional name, individual operations will retain their separate identity through product line designations such as: Peerless Pump, Chicago Pump, Coffin Turbo Pump, Mechanical Foundries, Sonith Foundries, Laval Underground Surveys, Varley-FMC Ltd., and Peerless, S. A. (Mexico).

POWERFUL, NEW
M&M BRUSH CHIPPER
handles limbs up to 8" diameter



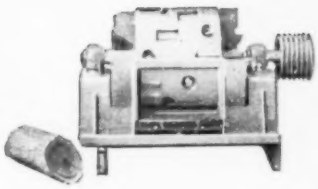
107

AMERICA'S
NO. 1 BRUSH CHIPPER

M & M's exclusive design of small, staggered and tapered cutting knives in the large cylinder allows chips to be shaved off . . . not cut off; makes it possible for this new chipper to handle 8 inch logs without creating impact shock responsible for damaging bearing and clutch wear.

Unique twin-bar design allows the chipper to produce either large or small chips . . . a profit-making feature, since small chips have many uses.

The heavy-duty M & M chipper has a built-in blower to regulate direction and distance of chips. Large, heavy rotating cylinder in between heavy-duty roller bearings eliminates overhanging flywheel. All-welded, special alloy steel construction



of simple design assures trouble-free operation and low maintenance costs.

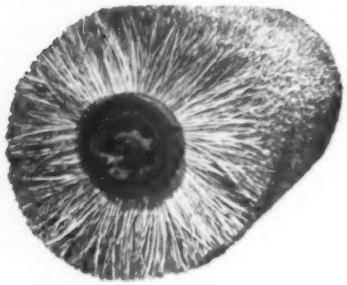
With the addition of this heavy-duty model, Mitts & Merrill manufactures a complete line of chippers in sizes and capacities for any brush disposal requirement. Write today for complete information.

LARGE AND SMALL M&M HANDLES THEM ALL!

MITTS & MERRILL • 1003 So. Water Street • SAGINAW, MICHIGAN

BUILDERS OF WORK-SAVING, MONEY-SAVING AND MATERIAL RECLAIMING MACHINERY SINCE 1854

FIBRES



for your
STREET SWEEPER BROOMS

Shipped immediately from
New York—Minneapolis—Los Angeles

- ☐ FLAT STEEL WIRE
- ☐ PALMYRA STALKS
- ☐ AFRICAN BASS
- ☐ SPLIT HICKORY

Contact us for fast, complete service on your bulk fibre and wire needs for Street Sweepers and Gutter Brooms. As direct importers and suppliers, with 3 warehouses serving the nation, we offer top quality fibres. Our prices are very competitive.

Contact your supply dealer or write for free samples and prices

STREET BROOMS

We supply the right street push broom for every job . . . at the right price . . . in all popular fibres including Calabar Bass, Bassine, Palmyra Stalks and Flonene Plastic.

Contact your supply dealer or write for complete information.

FLO-PAC FIBRES, Inc.

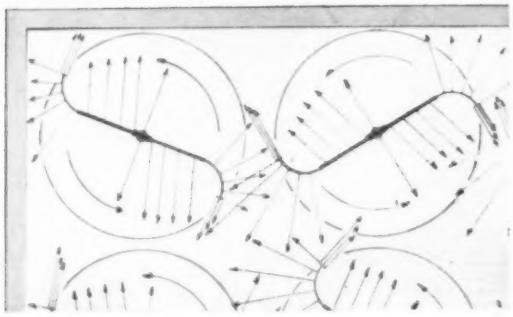
FLO-PAC BRUSHES

1501 4th Ave. So., Minneapolis 4, Minn.

Subsidiary of
FLOUR CITY BRUSH CO. MINNEAPOLIS 4, MINN.
PACIFIC COAST BRUSH CO. LOS ANGELES 21, CALIF.

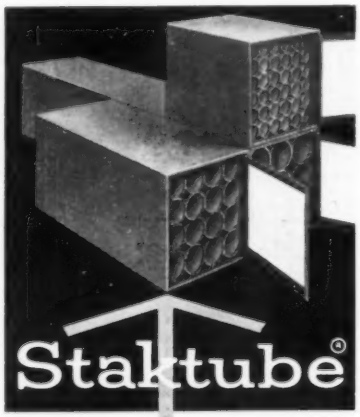
Purchasing News

S-Type Filter Bed Agitator Cleans the Corners

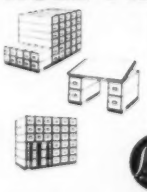


Water works men, here's a filter bed agitator that reaches the corners of a rectilinear structure and spans voids among multiple units operating in the same filter. Its arm ends curve in opposite directions to give each arm an "S" configuration. Nozzles are attached to both leading and trailing edges. And those on the straight portion of the arm are set both downward from the horizontal plain of the rotating arm and outward from the center. These compoundly angled nozzles tend to produce cross currents, promoting interchange of expanded filter media from one side of the filter bed to the other.

Palmer has designated its new agitator the S-type Model 58 and reports that tests show it to give a 25% to 30% further increase in filter cleaning efficiency. For additional information, and word on an adapter kit for older models, write PALMER FILTER EQUIPMENT CO., 822 E. 8TH ST., ERIE, PA., or use the Post Card on Page 56. Circle No. 867.



Stacor's lifetime steel ROLL FILE SYSTEM



"Easy-file easy-find" system to keep rolled prints, plans, maps clean, safe. 32 sizes—8 lengths, 4 tube diameters.

Send NOW for illustrated catalog

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329 Emmet St., Newark, N. J.
Phone: Bigelow 2-6600

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Has Fire Police Municipal Signs Catalogs

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P. O. BOX 810 • GRAND PRAIRIE, TEXAS

Buffalo Promotes

H. F. Barrett H. L. Edwards

Herbert F. Barrett, sales manager since 1930, has been named general sales manager of Buffalo Meter Company, Inc., Buffalo, N. Y. Both the industrial division for sales of Niagara liquid meters and the water meter division for sales of American water meters will be responsible to him.

Howard L. Edwards, formerly with Cla-Val Company, Newport Beach, Calif., and a former vice president-sales of the Sparling Meter Co., Los Angeles, has been appointed sales manager in charge of American Meter sales to water works and public utilities.

New President at Case

Marc B. Rojtman has relinquished his post as president and chief executive officer of J. I. Case Company, Racine, Wis., to "assume the important new position of Special Advisor to the president and executive committee."

William J. Grede, chairman of the Case executive committee for the past three years and former president of Grede Foundries, Inc., which he founded and developed into one of the largest independent producers of iron and steel castings in the country, succeeds Rojtman as president.

Hold Sales Briefings

The Koehring and Parsons Divisions of Koehring Company, Milwaukee 1, Wis., have been holding a series of regional sales conferences during February and March to provide the sales personnel of Koehring and Parsons distributors with the latest information on the equipment manufactured by the two divisions.

W. B. Dickerson, sales manager, is heading the Koehring Division sales group, which also includes P. E. Cunningham, A. V. Cossens, and Willis Fisher. Each division district representative is present at the conference held in his territory.

The Parsons sales group varies from conference to conference, including at various times Sales Manager R. E. Bansemer and district representatives John Harvey, L. D. Rose, R. H. Danford and Tom O'Donnell. Parson's president and general manager, T. J. Holdsworth, attended the Des Moines conference only.

New Transistor Pipe Detector

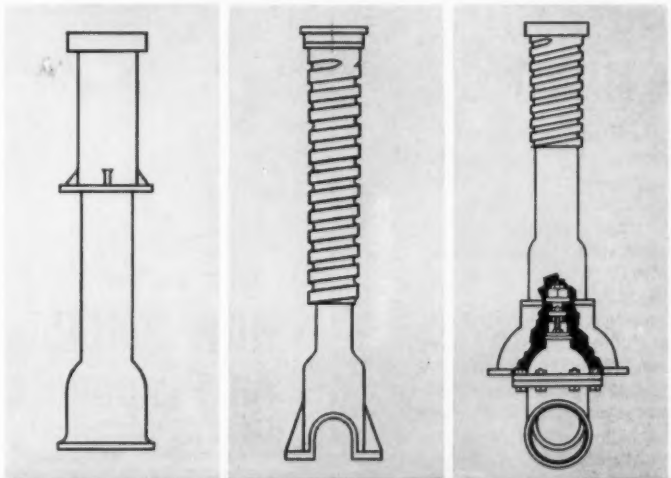
This unit—Detectron Model 808—employs a circuit specifically designed to utilize transistors to their fullest advantages. And it has licked the problem of heat limitation, an inadequacy said to be inherent in transistors, so that it is suitable for use in hot southern climates. Two transistors instead of one in the transmitter makes available

BUFFALO PIPE & FOUNDRY

BUFFALO MUNICIPAL CASTINGS

are available in every size and style!

No matter what size, shape or style municipal casting you may desire—you're practically sure to find a "Buffalo" casting to serve your needs. Or, where desired, castings may be made to your own specifications. Whether you need valve, service or roadway boxes, meter boxes, manhole rings and covers or other municipal castings, you'll find all "Buffalo" castings designed for service and dependability.



2 pc. sliding type adj. 5¼" valve box | 2½" water or gas ext. service box | 3 pc. screw type 5¼" valve box

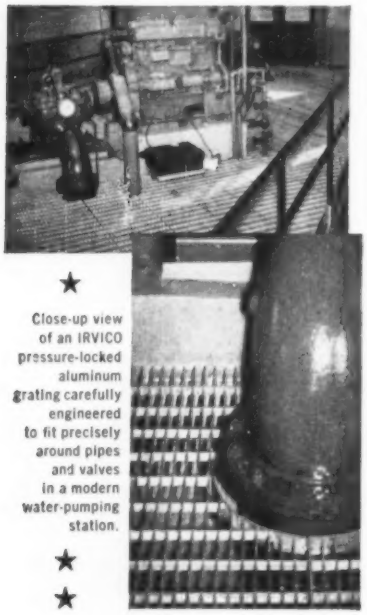
Prompt quotations given on all your standard or special gray iron or non-ferrous castings.

SINCE 1930
BUFFALO PIPE & FOUNDRY CORP.

Write or wire Dept. J for Bulletin M11.

BOX 55—STATION B DE 6764 BUFFALO 7, N. Y.

PRECISION AND SKILL



★

Close-up view of an IRVICO pressure-locked aluminum grating carefully engineered to fit precisely around pipes and valves in a modern water-pumping station.

★

★

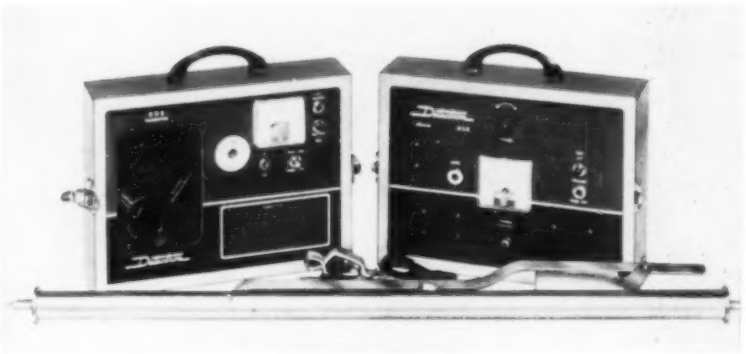
GO INTO A GOOD GRATING

When you specify IRVICO grating, you receive the benefit of engineering and manufacturing skill developed during more than 57 years of experience in the production of grating. Each IRVICO order is given careful engineering attention. Experienced shop craftsmen execute your order with finesse, and our inspectors permit no grating to be shipped unless it meets your specifications and our high quality grating, an excellent fit, and no extra installation costs. Catalog on request

IRVICO

IRVING SUBWAY GRATING CO., Inc.
Originators of The Grating Industry Est. 1902
Offices and Plants at:
5030 27th St., Long Island City 1, N. Y.
1830 10th St., Oakland 20, California

Purchasing News



Detectron Model 808

maximum power without sacrificing stability.

The "808" traces pipe by the conductive method, particularly advantageous in areas where highly mineralized soil is the problem, or where there are many abandoned pipelines. Unusually sharp cut-off of the detector assures separate detection of pipelines lying close together.

In addition to detecting and tracing pipe, cables, conduits, etc., the "808" also locates valve boxes, services, studs and miscellaneous metallic objects. The manufacturer reports that, if necessary, it can locate a pipeline so precisely that it can be marked on the pavement within an area narrower than the width of the pipe itself. Depth range of 1-inch water pipes approximates 10 feet; maximum depth range on large lines is 20 to 25 feet, depending on soil.

For additional information, write COMPUTER MEASUREMENTS CO., DIVISION 6, SYLMAR, CALIF., or use the Post Card on Page 56. Circle No. 881.

TODD INSECTICIDAL FOG APPLICATOR

MOSQUITOES
FLIES
AND OTHER
INSECT PESTS
DESTROYED ON CONTACT

TIFA

NOW Suitable for Operation on Propane or Gasoline

Lowest-Cost Space Control throughout the community. Peak performance against all insect pests . . . on the dump, over pools, in suburbs, play areas, everywhere insects swarm. Best by test for over 15 years, TIFA sets the records for lowest operating and maintenance costs in 5000 communities throughout the world. True clean fog with maximum efficiency, using newest or older type insecticides (solution, emulsion, suspension) . . . one man operation. Starter-generator optional.

Carrying Underwriters' Listing Seal MH 4162

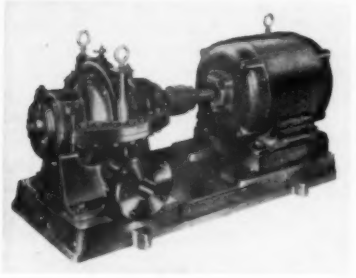
Write for illustrated folder with details and official comments.

TODD SHIPYARDS CORPORATION
PRODUCTS DIVISION

Sales and Service Departments: Columbia and Halleck Streets, Brooklyn 31, N. Y.
Plant, Sales and Service: Green's Bayou, Houston 15, Texas
Sales and Service Agencies throughout the Western Hemisphere

Purchasing

Has Mechanical Seal



Weil Pump Co.'s new horizontally split case pump, equipped with a mechanical seal and designed for leak-proof operation, is said to be specially adaptable for water supply systems, booster pump service, air-conditioning systems and heating systems. It is built for heavy-duty, long-hour service and operates with a minimum of vibration and noise.

The Type AY double suction pump is available in discharge sizes up to 6" with capacities to 2,000 gpm and heads to 400 feet. Motors can be supplied 1,750 rpm and 3,450 rpm. For additional information, write WEIL PUMP CO., 1530 N. FREMONT AVE., CHICAGO 22, ILL., or use the Post Card on Page 56. Circle No. 868.

New, All-Weather Tailgate Spreader

Sand, salt, cinders, gravel, slag, or other material—"Rollgate" spreads them all. It can spread as little as 75 pounds of chemicals per mile to any desired amount, and will spread material from a feather edge to a depth of 3" when seal-coating. Material in the dump truck can be emptied easily over the spreader without unhooking it from the truck. A sectionalized flexible keyboard

The Rollgate spreader is employed for ice control. Note sectionalized flexible keyboard which gives metered spread and permits oversized objects to pass through.

Vacuum-clean Pavements

the EASY, LOW-COST *"City Slicker"* Way

Do you have the problem of picking up pedestrian dropped litter in your busy downtown street gutters? On parking lots, shopping centers, playgrounds? Then this compact, Jeep-mounted, **Tarco "City Slicker" is your most economical** answer.

The "City Slicker" cleans a 6½ foot path by means of vacuum and air power . . . no brooms or brushes to wear out or service. **Sucks** up and **separates** for quick handling: (1) all kinds of **light bulky litter**: newspapers, paper cups and wrappings, cigarette butts, tin cans; (2) dry **sand**; (3) light fine **dust.** Maneuverable and **safe** to operate in heavy traffic . . . maximum operator visibility. Dusty air cleaned in special air cleaners.

The "City Slicker" is **most economical.** The actual **operating cost is less than ¼ of the curb-mile cost of most other cleaning methods** . . . for every mile you use a "City Slicker" you will cut your present costs up to 75%. By using a "City Slicker" you **release your large power sweeping equipment** for more important dirt sweeping operations for which they are designed.

"City Slickers" are **now performing** money-saving litter collection work in **several large cities.** They can do the same for you. For details see your TARCO dealer or write to us.

TARRANT MFG. CO.

23 Jumel Place, Saratoga Springs, N. Y.

HAMMOND 1999 DOG TAX 300

OFFICIAL MARKING

DOG LICENSE and RABIES TAGS of Quality

For highest quality at the right price—you can depend on Meyer & Wenthe—headquarters for durable dog and cat licenses, rabies tags and other revenue-producing license markers since 1854.

M & W tags are available in brass, aluminum, nickel silver, and anodized, permanent-colored aluminum, in green, yellow, red or blue. Furnished in design and lettering you want — with city, town or village, year, and consecutive numbering sunk into the metal. Standard or special shapes —with or without links.

Write for details and prices today.

MEYER & WENTHE, Inc.

Dependable Marking Devices Since 1854

30 S. Jefferson Street, Chicago 6, Illinois

THE *RECREATION* LINE

WHEREVER CHILDREN PLAY *Safely!*

Recreation equipment with engineered safety to meet the most rigid requirements.

- **Playground Equipment**
- **Indoor Basketball Backstops**
- **Swimming Pool Equipment**

Literature for each line available on request—please specify.

DEALER INQUIRIES INVITED

RECREATION EQUIPMENT CORP

Dept. AC-60 — 724 W. 8th St.
Anderson, Indiana

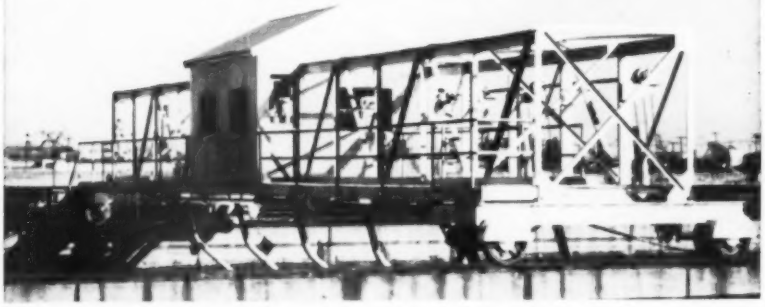
KOMLINE-SANDERSON

RECTANGU-LINE SLUDGE COLLECTORS

• No machinery or mechanical parts under water • Trouble free • Exceptionally low maintenance • Provides sludge scraping and skimming • Self-propelled traveling bridge type structure • Variable speeds attainable • No skewing or crabbing of machine on rails • No cables to pull units.

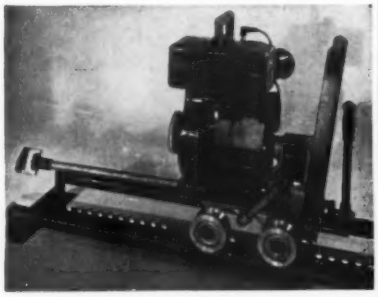
Another dependable piece of equipment added to the Komline-Sanderson line of quality equipment.

KOMLINE-SANDERSON ENGINEERING CORPORATION
PEAPACK, NEW JERSEY



Champion Fire Apparatus
W. S. DARLEY & CO.
CHICAGO 12

EBMI
Underground Boring Machine
New! Improved!



Model 70

- BORES—with no surface break
- BORES—up to 250 feet in length
- BORES—up to six inches diameter
- BORES—so drill stem of pipe of conduit stays
- BORES—1,000 feet on 1 Gal. of gas
- REAMS—up to 12 inches diameter

Write immediately for information.

EBMI
EARTHWORM BORING MACHINE, INC.
P. O. Box 1100
Santa Monica, California

Purchasing

which gives a metered spread and permits oversized objects to pass through helps to eliminate hand patching and streaks in seal-coating.

The spreader fits any dump truck body that is 7½′ or 8′ wide, and gives a full 8-foot-wide spread. It is hydraulically driven either by connecting into an existing truck hydraulic system or by a separate P.T.O. pump, and package. Hydraulic drive permits spreading while the truck is moving forward or backwards.

"Rollgate" is 20″ high, 24″ long and 8′7″ wide. For additional information, write GOOD ROADS MACHINERY CORP., MINERVA, OHIO, or use the Post Card on Page 56. Circle No. 844.

Portable, Gas-Powered Rock Drill

If there's a light drilling job to be done, or if it's too costly or impossible to move a compressor into position, the 53-pound, one-man operated Cobra could probably provide you with an efficient, economical solution to the problem.

It drills to 13-foot depths, comes equipped with a one-cylinder, two-stroke engine that drills 50-60 feet of hole on a single two-quart tankload of fuel, and drills in any position up to 45°. Even in hardest granite it is said to be able to drill 26 or more feet of hole an hour. Silencer and 17-foot exhaust hose are available as optional equipment.

A variety of standard tools makes the Cobra an all-purpose unit: drill steel, moil point, wedge, asphalt cutter, spade, tie tamper, tamper

with stem, plug-and-feathers set, driver, post hole tool. Municipalities will find the Cobra a handy tool for test hole drilling, parking meter installation, cable or pipe laying, backfilling trenches, street repair, breaking concrete.

For complete details, write ATLAS COPCO, 545 FIFTH AVE., DEPT. AC-7, NEW YORK 7, N. Y., or use the Post Card on Page 56. Circle No. 882.

1960 Rotomist Line

The five air-type mist sprayers in the 1960 line of Rotomists have been designed especially for shade tree spraying and mosquito control.

Model 300 is the largest. Its pump is a Royalette 10 with pressure adjustable up to 400 psi at 10 gpm. The blower consists of an axial-flow, 6-blade propeller 40″ in diameter with straightening vanes. Tank capacity is 300 gallons. It is designed principally for shade tree spraying.

So is Model 100, which features the Royalette 10 enclosed oil bath John Bean plunger-type pump. The air delivery unit is a 29″, 10-blade, axial-flow fan. It has a 100-gallon Bean-Bonded tank.

Model 75 delivers its air from a 26″, 7-blade, axial-flow fan and has a John Bean Royalette 5, positive-displacement pump with a capacity of 5 gpm up to 400 psi. Tank capacity is 75 gallons.

Both the Model 50 and the all-new Model 51 have air-delivery units with 21″ axial-flow fans powered by 13-hp, 2-cylinder, air-cooled engines. Each has a fuel oil injecting system which emits smoke into the air stream to trace the spray pattern. The Model 50 is an air unit only and is to be used with a high pressure sprayer. Model 51 is mounted on a 75-gallon steel tank and is equipped with a Hypro pump. Pump capacity is 15 gpm at 150 psi.

For further information, write JOHN BEAN DIVISION OF FOOD MACHINERY & CHEMICAL CORP., LANSING 4, MICH., or use the Post Card on Page 56. Circle No. 874.

Fly-Free Trickling Filters

An effective larvicide, developed and introduced by Zep Manufacturing Corp. of Atlanta, Ga., eliminates the problem of filter flies and their larvae in trickling filter systems

REMOVE STUMPS FAST

even in hard-to-reach locations

new tractor-powered "STUMP GOBLER" costs $1000-$3000 less than similar equipment

Now you can get rid of unsightly, hazardous stumps in a hurry . . . no matter where they are. Removal is easy in restricted working space near fences, walks and curbs . . . completely safe in areas adjoining power cables, gas lines, water mains, and sewers.

Best of all, the new STUMP GOBLER uses the power you already have in any conventional tractor . . . costs as much as $3000 less than bulky, self-powered units. Average less than 10 gallons of gasoline for a full day's operation.

Simple hydraulic controls move the STUMP GOBLER across the stump, taking a bite 12 inches wide and 1 to 2 inches deep with every pass . . . removing a 2 foot stump in 10 to 15 minutes, a 3 footer in 15-20 minutes. Goes deep enough to permit plowing or resurfacing.

Write today for the full story of the amazing new STUMP GOBLER. Let us know the make and model of your tractor and any special applications in which you may be interested. We'll send you complete information.

MYERS-SHERMAN COMPANY

3567 S. Illinois Street • Streator, Illinois • Phone 2-2176

FOR EFFICIENT

BACK DOOR SERVICE

- 50 Gallons (22"Dia. x 30")
- 7 lbs. Light
- Waterproof
- New Puncture-proof Bottom
- New Stiff Construction

CARRY-BARREL

OF MIRACLE PLASTIC TUFLITE

We have supplied hundreds of refuse companies and municipalities with this type of collection barrel in the past year. The new CARRY-BARREL embodies many major improvements suggested by our many users. A new top ring of ¼" steel gives a rigid tear-free opening. A stiff insert disc in the bottom prevents punctures and gives needed stiffness. This improved unit will give 6 to 12 months of 6 day a week service. Not susceptible to cracking above 10° degrees F.

COUNTY CHEMICAL CO.

1235 Newbridge Road North Bellmore, N. Y.

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Put A LOAD SWEEPER On Your MICHIGAN Tractor Shovel

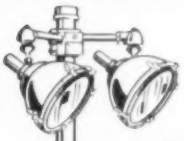
For full details consult your Michigan tractor shovel distributor or •••••

LOAD SWEEPER DIV.

CLARK-WILCOX CO.

118 Western Ave.

Boston 34, Mass.



For **LOW-COST OUTDOOR LIGHTING!**

the Original

HOPE

MALLEABLE IRON METAL-PIPE POLE BASE

A Rugged Support for Threaded Pipe Uprights With Chamber for Splicing and Grounding.

Turn galvanized pipe into threaded hub of galvanized base. Top off with fixture. Install over embedded anchor bolts and conduit stubs. Splice and ground through hand-hole. Four sizes: 2", 2½", 3", 4". Plain or 3-pole receptacle cover. Bulletin #25.

CONSULT YOUR ELECTRICAL WHOLESALERS OR PHONE ONE OF OUR AGENTS BELOW!

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Ala.	Mobile	GReenwood 1-5621
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La.	Baton Rouge	Dickens 2-2873
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Tex.	El Paso	PRescott 2-2881
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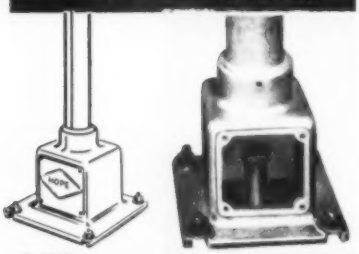
Va.	Va. Beach	GArden 8-3837
Wash.	Bellevue	GLencourt 4-0566
Wis.	Milwaukee	UPtown 1-4900

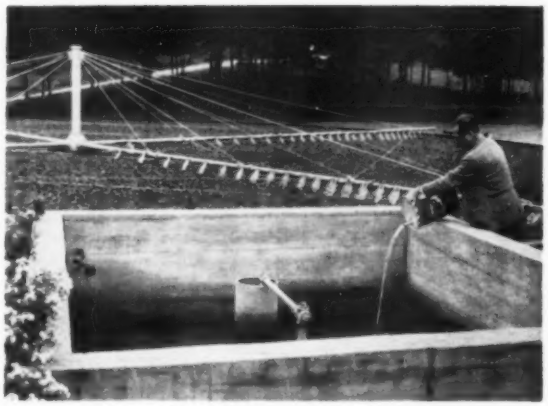


© 1959

HOPE ELECTRICAL PRODUCTS CO.

53 Long Ave., Hillside, N. J., ELizabeth 4-7837

Purchasing News



Zep filter fly larvicide consistently kills a high percentage of filter flies on rocks in trickling filters. It is shown being introduced directly into the main sewage line.

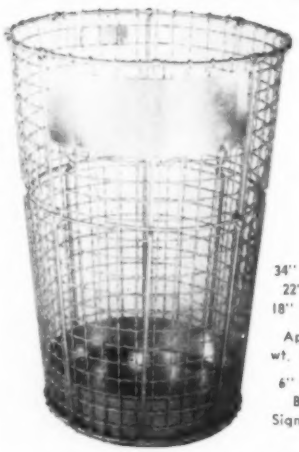
without flooding, curtailed operations or costly shutdowns. According to Dr. Harold Friedman, Director of Research, Zep Filter Fly Killer was formulated to meet recommendations contained in a study by the city entomologist of the Dallas, Texas, Public Health Department.

The newly developed larvicide contains high concentrations of malathion and dieldrin, which have proved effective against Psycodids and their larvae breeding on the rocks of filter units. Recommended treatment consists of a single calculated dose introduced directly into the main sewage line prior to entrance of sewage into sprinklers of the trickling filter system. This method of control is inexpensive and noninjurious to the operation of the filter unit.

Recommended dosage is one gal-

LET THE PUBLIC *keep your* STREETS and PARKS CLEAN . . .

USE NORWICH STREET AND PARK BASKETS



34" Deep
22" Top
18" Bottom

Approx. wt. 43 lbs.

6" x 16" Blank Sign Plate.

HOT DIP GALVANIZED AFTER FABRICATION

Shipped from stock in any quantity

Call or Write

NORWICH WIRE WORKS, INC.
159 STATE STREET, NORWICH, N. Y.

GRIMCO *Signs*

We Can Supply 5, 50, or 5,000 Embossed Aluminum or Steel Signs, posts, new 1-pc. aluminum bracket.

OVER 200 U. S. STANDARD TRAFFIC SIGNS CARRIED IN STOCK FOR PROMPT SHIPMENT

new - HAND SIGNS

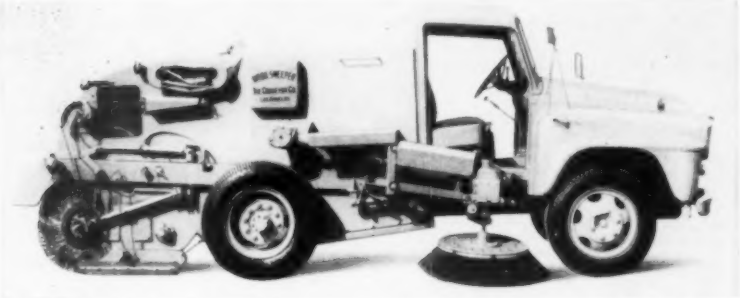
Here's a new 18" two-sided Lightweight Aluminum hand sign for schools, rail crossings, construction crews, utilities, industrial plants, etc.

WRITE FOR A QUOTE OR A CATALOG

GRIMM STAMP & BADGE CO.
8105 Rosalie • St. Louis 17, Mo.

lon of Zep Filter Fly Killer for every 500 gallons-per-minute of sewage flow. The total amount of larvicide to be used is added to the system within one minute. After initial treatment, a second one should follow within five days. Filter flies can then be kept under control with weekly inspections and larvicide applications whenever larvae happen to appear.

For additional information, write ZEP MFG. CORP., 1310 SEABOARD INDUSTRIAL BLVD., ATLANTA, GA., or use the Post Card on Page 56. Circle No. 895.



This is Mobil Sweeper's new twin-engine street sweeper, the Model TE. It has a separate rear engine to drive its sweeping mechanism, enabling brooms to operate completely independent of the vehicle's forward speed. For additional information, write MOBIL SWEEPER DIVISION, CONVEYOR CO., 3260 E. SLAUSON AVE., LOS ANGELES 58, CALIF.

Red Flint

FILTER SANDS

UNDERDRAIN

GRAVELS

PROCESSED TO EXACTING SPECIFICATIONS
SHIPMENTS MADE BULK or BAGS—ANY QUANTITY

EAU CLAIRE SAND & GRAVEL CO.

Eau Claire, Wis.—Phone TE 4-4164

Distribution of Filter Sands and underdrain Gravels to all States — and Territories of the U. S., Canada and Mexico

SPEED CONSTRUCTION JOBS

SWENSON SPREADERS

FOR

Sealcoating

SAVE...

✓MEN
✓MONEY
✓MACHINES

Swenson Spreaders spread salt, calcium chloride, sand, gravel, cinders, or any combination of these materials in any quantity desired . . . in narrow strips or full traffic lanes. Clutch-controlled flow for steady or intermittent spreading. Operates at speeds up to 30 M.P.H. — forward or reverse. Swenson Spreaders are available in various sizes to fit any dump truck box. Fewer trucks, fewer men and less material are needed to spread a given area. This year trim your construction costs with Swenson Spreaders. Write us today!

SWENSON

SWENSON SPREADER & MANUFACTURING CO.
LINDENWOOD, ILLINOIS

ABOUT PEOPLE

G. C. Cessna *R. H. Benkendorf*

Gerald C. Cessna and Roy H. Benkendorf have joined the sales department of the **Harley-Davidson Motor Co.**, Milwaukee, Wis., according to Walter C. Davidson, vice president sales. Mr. Cessna will serve as manager of Police, Commercial and Military Sales; Mr. Benkendorf as an administrative sales assistant in the domestic sales department.

The consulting engineering firm of **Hill and Ingman,** 3104 Western Ave., Seattle, Wash., has announced promotion of William J. Chase to junior partnership. Senior partners are Allen E. Hill and Gordon Ingman.

Richard Henry has been promoted to sales manager by Ka-Mo Tools Department of the **Kwik-Mix Co.,** Port Washington, Wis., a division of the Koehring Co.

Stephen N. Krist, general manager of Rockwell - Standard Corporation's new subsidiary, **Kerrigan Iron Works Co.,** Nashville, Tenn., has made known the appointment of Ted Nemes as sales manager of Kerrigan's Lighting Standard Division.

Ted Nemes

In moving to Kerrigan, Mr. Nemes stated that the potential is great in the lighting standard field, for most of the nation's streets and highways are now inadequately lighted, not only for traffic safety, but for the prevention of crime.

Joseph W. Lipscomb is now associated with **Gannett Fleming Corddry & Carpenter, Inc.,** Consulting Engineers, as chief engineer of the Florida offices, located at 523 N. Halifax Ave., Daytona Beach.

Paul A. McDonald has been appointed district manager for the states of California, Nevada, Utah and Arizona by the Koehring Division of **Koehring Co.,** Milwaukee, Wis., construction equipment manufacturer. His address is P. O. Box 447, Danville, Calif.

B-I-F Industries, Inc., of Providence, R. I., announces the formation of eastern, central and western regional operations for its U. S. and Canadian field sales organizations. Douglass Taber, will direct the eastern region from headquarters in New York City; Paul A. Coffman, Jr., the central region from headquarters in Chicago, and Edward F. Morey, Jr. the western region from offices in Dallas.

New vice president in charge of sales for the **Kaiser Steel Corporation,** Oakland 12, Calif., is C. L. Emerson, general sales manager since 1954.

T. J. Montgomary, City Engineer, City of Cincinnati, Ohio, has retired from active service after twenty-seven years with the city. During this period Mr. Montgomery has served as assistant superintendent of highway maintenance, principal construction engineer, and for the past ten years city engineer. During his appointment as city engineer $67.6 million in public works contracts were awarded. Mt. Montgomary will spend his retirement years in the St. Petersburg, Fla. area. He is succeeded by Arthur C. Bird, C. E.

T. J. Montgomary

William T. Ingram, Consulting Engineer, with offices at 21 Point Crescent, Whitestone 57, N. Y., has opened a West Coast office at 90 Panoramic Way, Walnut Creek, Calif., with Fred R. Ingram as associate in charge of that office. Professional services offered by both offices provide sanitary engineering consultation concerned with control of environment and include water purification, sewage and industrial waste treatment, air pollution control, industrial hygiene, and related research planning and design.

William M. Cramer has been named New England and upper New York State district representative for the "Michigan" line of construction and bulk materials handling equipment manufactured by Construction Machinery Division, **Clark Equipment Co.,** Benton Harbor, Mich.

George N. Shaw, well-known in municipal finance circles and formerly director of finance of the City of Miami, Fla., has joined the municipal financial consulting firm of **Wainright & Ramsey Inc.,** New York, N. Y., as a vice president. Mr. Shaw will manage the firm's new Florida office, located in the First National Bank Building in Miami, and will work on the firm's larger assignments throughout the country.

As advertising manager of **Keuffel & Esser Co.,** Hoboken, N. J. engineering and drafting supply manufacturer, William R. Franklin will direct all advertising and public relations projects for the company. Mr. Franklin has been with K&E since 1957 when he joined the firm as assistant to the advertising director.

W. R. Franklin

Hersey-Sparling Meter Co., Dedham, Mass., has named Joseph W. Jackman to the newly created post of Director of Sales at the El Monte, Calif., plant and Robert E. Burch sales manager of the irrigation division.

R. M. Boone has been transferred from the Mount Vernon, Ohio headquarters of **The Cooper Bessemer Corp.** to the Odessa, Texas branch office, according to George Edick, domestic sales manager for the company.

James R. Erven, vice president in charge of sales for **Kennedy Valve Mfg. Co.,** Elmira, N. Y., has been elected a director of the company. Mr. Erven joined Kennedy Valve as a sales representative in 1950 in New Orleans and was named branch manager of the New York City office in 1952. In 1956 he was appointed vice president in charge of sales and moved to the Elmira office.

J. R. Erven

Jack Stewig is now product manager of the CRF Division of the **Waukesha Motor Co.,** Waukesha, Wis.

Pfaff and Kendall, Newark, N. J. manufacturer of traffic control equipment and street, highway and area lighting equipment, has named a new representative for the State of Hawaii. He's Matt Cabot, a registered mechanical and electrical engineer who has been a resident of Honolulu for two years. He will handle the P & K outdoor lighting product line.

Matt Cabot

Ebert B. Mueller was elected to the board of directors of **Mueller Co.** at

(Continued on page 236)

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About People

(Continued from page 234)

the company's annual meeting held in Decatur, Ill. All other officers and directors were re-elected.

Governor Nelson Rockefeller has appointed James C. Harding, Public Works Commissioner of Westchester Co., N. Y., to a 9-man legislative commission, established to study water resources planning and development in New York State. Mr. Harding will be the only engineer on the Commission. He is a recipient of the Diven Memorial Medal (1945) and the Fuller Award (1959), citations from the American Water Works Association.

The **Henry Pratt Company** of Chicago 7, Ill. has appointed Henry C. Schwenk vice president - sales, and William R. Perez, Jr., assistant secretary. Formerly general sales manager, Mr. Schwenk will be responsible for the sale of all the company's manufactured products.

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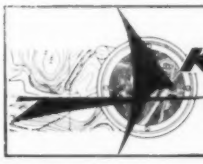

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J. F. FREEMAN, SUPT. AND WARDEN OF SUMTER COUNTY, GA., REPORTS:

"CAT EQUIPMENT GETS MORE WORK DONE AND COSTS LESS TO DO IT"

Construction and grading of Lamar Road, four miles east of Americus in Sumter County, Georgia, gave county officials an opportunity to discuss their methods and machinery in county road construction.

At work on the grading were three tractor-scraper combinations: a D7 Tractor and No. 435 Scraper and two D7s with No. 70 Scrapers. (Sumter County also owns two Cat D6 Tractors and four Cat Motor Graders.)

"Our Caterpillar road building machinery has always given us mighty satisfactory service," said J. F. Freeman, Superintendent and Warden of Sumter County. "My observation over the years is that it gets more work done and costs less to do it."

Getting the work done economically has long been routine for Caterpillar track-type Tractors and Scrapers: this combination of traction and capacity has been the backbone of many efficient dirt-moving spreads. They're the economy masters of the short hauls and the rough ground conditions. Track-type tractors and four-wheel scrapers are naturals for steep grades, rough rocky ground and mud. Conditions that would sideline rubber-tired tractors, or short hauls that would make the high-speed units uneconomical are easy jobs for crawlers.

Your Caterpillar Dealer has production information on a full line of crawler tractors and four-wheel scrapers. He has the equipment to fit *your* dirt-moving job. Ask for a demonstration.

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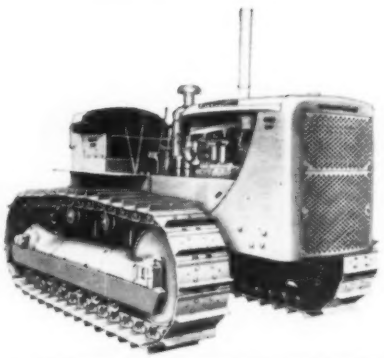

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The scene: City Hall, Somerville, Mass. **The award:** for the year's best municipal accounting system. **The job:** receipting of all tax payments, preparation of related journals, records and daily cash sheets. **The equipment:** two Burroughs F-200 Sensimatic to Punched-Tape units. **The results.** reports Somerville: receipt transaction work load cut 68%; *real* cash control instead of "cash reported" control; no more clerical or copying errors; accurate complete analyses of receipts by day, week, month, year or any combination. All this at a savings of $3,900 a year.

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New Tractor Shovel brings new economies to small town

Michigan introduces Model 55A, early purchaser reports it does many jobs previously skipped (or handled by $10/hr. rental units)

Like many small communities, the Village of Pewaukee, Wisconsin, for years handled loading and clean-up chores with a farm-type tractor and various pieces of rental equipment. As may be expected, costs were high. But so too, reasoned the Village Board, would be the initial expense of buying a bigger machine . . . especially to a town of only 2000 people.

Then last spring, Aring Equipment Co, Michigan Distributor in Milwaukee, showed the new Michigan 1 yard Model 55A. Price, with trade-in, under $10,000. Back-hoe, snow plow, sweeper, a lot of other attachments could be added later.

Everyone was impressed. It was easy to figure how this unit's four-wheel-drive, speed and versatility could cut expenses. Also, how it might handle the many jobs previously not done at all or, at best, done inefficiently.

"Since then," says Gary Boyce, Pewaukee Supt of Public Works, "we've used our Michigan *for everything*." For instance . . .

Saves $50 weekly rental at the sanitary landfill. The Village makes a monthly pick-up; between times, villagers dump their own trash and rubbish. Once a week a rented crawler would clean up; between times the dump was messy. Now, the Michigan, with 26 mph mobility, runs out every day or two. Clean-up is done quickly, the old $10 per hour crawler rental expense is eliminated.

Cleans lakefront. Located on a popular resort lake, Pewaukee has the problem of keeping its beach clean. Lake residents and motor boats cut weeds. Prevailing winds blow them to shore . . . sometimes piling them a foot thick. Previously, each cleanup took 15 man hours . . . "hand hours" since the farm tractor couldn't work in sand. Now, the Michigan wades in hub-deep, shoves weeds onto shore, loads them in truck. In *one hour* the job's done.

Stockpile-loads sand, salt, blacktop, stone. The power steer, powershift Model 55A with 1 yd bucket heaps a 5 yd truck in five passes, 2 to 2½ minutes. Pewaukee's old farm-type loader took 5 to 7 minutes for the same job . . . *if* the material wasn't frozen.

Takes place of truck. When trucks are busy, the Michigan may carry its own load a block or a mile or more. Street patching is a good example. Here, the 26 mph Model 55A carries a yard of blacktop down the street —stops at potholes—operator or helper hand-shovels and packs in materials as needed.

Tree trimming. Due to inadequate equipment, this once was a chore rarely attempted. Now, the Michigan, used as a fast-moving lift-truck, raises a man up to 8 feet off the ground for trimming with chain saw or 18 foot pruner. Thus street lights have been made more efficient . . . traffic hazards removed.

These are but a few of the jobs where the 66½ hp Model 55A is saving time, trouble, and money for the Village of Pewaukee. Let us show you, *first-hand, how it can do the same for you!*

Michigan is a registered trademark of

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